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YMPÄRISTÖEKONOMIA
Ympäristöä säästävien liiketoimintojen tutkimusten anti liiketoimintaosaamiselle

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Ekonomia tarkoittaa sekä taloustiedettä että säästäväisyyttä. Ympäristöekonomia on siis sekä ympäristötaloustiedettä että luonnonympäristöä säästävää (liike)toimintaa. Se on yksi liiketoimintaosaamisen muoto.

Ympäristötaloustieteen eri muodot ovat kehittyneet 1990-luvun alusta alkaen yhdessä yritysten ympäristöjohtamismuotojen kehittymisen kanssa, usein niitä intuitiivisesti suunnitellen ja ennakoiden, ja aina niitä loogisesti analysoiden ja arvioiden. Ympäristötaloustieteen eri alat eivät muodosta erillistä koulukuntaa, vaan ympäristöasiat läpäisevät kaiken liiketoiminnan ostoista, tuotannosta, varastoinnista ja kuljetuksista markkinointiin, laskentatoimeen, juridiikkaan ja johtamiseen.

Vastaavasti yrityksissä ympäristöasiat eivät ole mitään erillisiä esikuntayksiköissä hoidettavia asiantuntijatehtäviä, vaan kaikkien toimintojen linjajohtajien vastuulla olevia tehtäviä, joita kaikki linjaorganisaation työntekijät toteuttavat omissa töissään.

Luonnonarvojen – luonnon välittömän arvon, välillisen arvon, optioarvon, olemassaoloarvon ja itseisarvon – säilyttämiseen tarvitaan luonnon varoja, puhtautta ja monimuotoisuutta säästävää liiketoimintaa (ks. Ketola 2005a), jota saadaan aikaan vain kaikkien toimintojen ja ihmisten yhteistyöllä..

Öljy-yhtiö Nesteen toimitusjohtaja Jaakko Ihamuotila sanoi häntä vuonna 1991 haastatellessani, että 10–20 vuoden päästä yritykset olisivat niin sisällä ympäristökysymyksissä, että ne ottaisivat automaattisesti ympäristöasiat huomioon kaikissa päätöksissään ja teoissaan (Ketola 1991). Nesteen seuraajan, Fortum Oilin (vuodesta 2005 alkaen Neste Oilin), toimitusjohtaja Risto Rinne kertoi vuoden 2002 haastattelussa, että yhtiön kaikille yksiköille oli annettu ohjeet noudattaa kaikissa päätöksissään ja toimintasuunnitelmissaan seuraavaa prioriteettijärjestystä: turvallisuus, ympäristö, kannattavuus ja kasvu (Ketola 2003, 2005b).

Opettaessani ympäristöjohtamista englantilaisessa Brunelin yliopistossa vuosina 1995–1999, pidin tärkeänä, että opiskelijat ymmärtäisivät sen, miten ympäristönäkökohtien kriittinen sisältö pitäisi integroida yrityksen kaikkiin toimintoihin. Siksi eräs ympäristöjohtamisen kurssini, jonne kutsuin asiantuntijoita luennoimaan, kattoi kaikki yllämainitut yritystoimintojen alat.

Koska ympäristötaloustiede ei ole oma tieteellinen koulukuntansa, ei sillä myöskään ole omia erillisiä teorioita ja tutkimusmenetelmiä, vaan se käyttää taloustieteen vakiintuneita tutkimusmalleja ja -metodeja. Tässä onkin ympä-

ristötaloustieteen vahvuus: yrityksille, sen sidosryhmille ja tutkijoille tutuilla teorioilla ja ajatusmalleilla esitetty ympäristöasia sulautuu luontevasti itsestään selväksi osaksi liiketoimintaa, yhdeksi vastuullisen liiketoiminnan kriteeriksi.

Ympäristövastuu onkin muodostunut tärkeäksi osaksi 1990-luvun lopusta asti kehittynyttä vastuullista liiketoimintaa, jossa on kolme osa-aluetta: taloudellinen, sosiaalinen ja ympäristövastuu.

Ympäristönäkökohtien huomioon ottoa yritysten päätöksenteossa voidaan perustella ainakin hyöty-, velvollisuus- ja/tai hyve-eettisin syin (ks. Ketola 2005a). Hyötyeettinen eli utilitaristinen näkemys painottaa ympäristötehokkuuden tuomia kustannussäästöjä ja ympäristömyönteisyyden tuomia liiketoimintamahdollisuuksia, lisävoittomarginaaleja ja imagoetuja. Velvollisuuseettinen näkemys pitää liiketoiminnan perustana oikeudenmukaisuutta kaikkia, myös luontoa kohtaan. Jokaisen ihmisen ja organisaation velvollisuutena on suojella luontoa. Hyve-eettinen näkemys arvostaa kohtuuteen ja harkintaan perustuvaa hyveellistä toimintaa, joka asettaa luonnon itseisarvon sen hyötyarvojen edelle.

Useimpien yritysten ja niiden johtajien puheissa hyöty-, velvollisuus- ja hyve-eettiset luontoarvot saavat kaikki ymmärrystä osakseen. Käytännössä monet yritykset toimivat kuitenkin hyötyeettisten arvojen ohjaamina. Valitettavasti niiden kvartaaliekonominen aikaperspektiivi saa ne tavallisesti valitsemaan liiketoiminnassaan ympäristön huomioon oton hyödyistä vain helposti ja nopeasti saatavat kustannussäästöt ja voitot.

Sellaisiin luonnon hyvinvointia edistäviin liiketoimiin ei useinkaan ryhdytä, jotka aluksi aiheuttaisivat kustannuksia, mutta toisivat pitkällä aikavälillä hyötyjä, sillä yritysten johtajat kokevat heiltä vaadittavan näkyviä taloudellisia tuloksia heti, ilman viivettä ja kustannusten hetkellistä lisäystä. Jos yritysten halutaan ottavan ympäristönäkökohdat kokonaisvaltaisesti huomioon päätöksissään, taloudellistenkin sidosryhmien – kuten omistajien, rahoittajien, finanssianalyytikoiden ja arvopaperipörssien – tulisi kannustaa niitä pitkän aikavälin ympäristösuunnitteluun. Rahoitusmarkkinoilla ympäristövastuusta voidaan siis tehdä hyve. Viranomaiset yhdessä kansalaisjärjestöjen kanssa ovat jo tehneet ympäristövastuusta velvollisuuden, jolla on lakeihin perustuva minimitaso. Näin eri sidosryhmien yhteisvastuulla voidaan saada aikaan ympäristövastuu, joka on velvollisuuden lisäksi hyve ja tuottaa hyötyjä sitä kantaville yrityksille.

Tässä kirjassa kannustetaan yrityksiä sekä niiden nykyisiä ja tulevia johtajia pidemmän aikavälin hyötyjen arvostamiseen, velvollisuudentuntoon ja hyveelliseen ympäristövastuuseen esittelemällä, analysoimalla ja arvioimalla ympäristöekonomiatutkimuksen käytännön tuloksia. Kauppakorkeakoulun opiskelijat kuuluvat yritysten (nykyisiin ja) tuleviin johtajiin ja asiantuntijoihin, joiden arvomaailma vaikuttaa suuresti siihen, millaiseksi yritysten liiketoiminta

kehittyy. Tätä kirjaa voi käyttää myös ympäristöekonomian tai vastuullisen liiketoiminnan opintojen kurssikirjana sekä jatko-opiskelijoiden ja muiden tutkijoiden ympäristötaloustieteen tietopohjan laajentamisessa.

Kirja kattaa kuusi taloustieteen aineen ympäristötutkimusalaa, joista jokaisesta esitellään tohtoritutkijan väitöskirjatutkimukseen tai tutkijatohtorin väitöskirjan jälkeiseen tutkimukseen liittyvä artikkeli:

Luku	Aine: =>	Tutkimusala =>	Tutkimusaihe
1.	Talousmaantiede	Teollinen ekologia	Hyötyjätekauppa
2.	Logistiikka	Ympäristölogistiikka	Ympäristölähtöiset maantiekuljetukset
3.	Yritysjuridiikka	Ympäristöoikeus	Ympäristösäätelytyylit
4.	Laskentatoimi	Ympäristölaskentatoimi	Ympäristöraportointi
5.	Johtaminen	Ympäristöjohtaminen	Johtamisen vihertyminen
6.	Organisaatiot	Organisaatiot ja ympäristö	Ekopsykologinen organisaatiokäyttäytyminen

Luvussa 1 Nina Aarras kertoo *hyötyjätekaupan* mahdollisuuksista yrityksille. Artikkeli liittyy hänen valmisteilla olevaan väitöskirjatutkimukseensa. Yritysten jätehuolto perustuu jatkuvasti tiukentuvaan lainsäädäntöön, joka aiheuttaa yrityksille lisäkustannuksia, mutta liiketoimintansa holistisesti näkeville yrityksille siitä on tulossa imagonparannuskeinon lisäksi myös huomattava liiketoimintamahdollisuus ja kilpailuetu. Jätteistä on tullut arvokasta raaka-ainetta, jota voidaan myydä, ostaa, kuljettaa, varastoida ja hyödyntää tuotannossa ja markkinoinnissa.

Hyötyjätekauppa on siis uudenlainen, laajoja mahdollisuuksia tarjoava liiketoimintatapa. Sen harjoittaminen edellyttää hyötyjäteketjujen ja -verkostojen rakentamista sekä eri yritysten välille että yritysten suhteissa viranomaisiin ja päättäjiin. Hyötyjätekauppa on täten liiketoimintaosaamisen uusi muoto, joka vaatii asiantuntemuksen, viestinnän ja muiden taitojen kehittämistä, ja antaa vastineeksi mahdollisuuden mitä innovatiivisimpiin liiketoimintaratkaisuihin.

Ympäristövastuullisten kuljetusten suunnittelu ja toteuttaminen ovat toinen uusi logistiikkaan liittyvä liiketoimintaosaamisen muoto. Kuljetuksissa eivät ympäristövaikutukset ole yleensä olleet ratkaisevina päätöskriteereinä, vaan niitä ovat olleet taloudelliset, laadulliset ja ajalliset seikat. Kilpailu eri kuljetusmuotojen markkinoiden välillä ja sisällä kovenee kuitenkin jatkuvasti ja uudet kilpailukeinot ovat tervetulleita.

Luvussa 2 Pekka Stenholm osoittaa, kuinka maantiekuljetusyritykset voivat negatiivisia ympäristövaikutuksiaan vähentämällä parantaa kilpailukykyään. Hän selostaa rakentamansa *maantiekuljetusyritysten ympäristölähtöisen kilpailukyvyn mallin* periaatteet. Maantiekuljetusyrityksen ympäristölähtöinen

kilpailukyky perustuu yrityksen ympäristöosaamiseen, yrityksen yli ulottuviin prosesseihin sekä asiakkaiden ja yhteistyökumppaneiden kanssa tapahtuvaan yhteistyöhön. Nämä ovat sellaisia liiketoimintaosaamisen muotoja, joilla yhdistetään yritysten taloudelliset ja ympäristönsuojelun edut. Artikkeli pohjautuu Stenholmin väitöskirjaan, joka tarkastettiin ja hyväksyttiin 10.12.2004.

Yritysten kaikessa liiketoiminnassa suhteet sekä ympäristölainsäädännön noudattamista valvoviin viranomaisiin että lakien miniminoudattamisen ylittämistä odottaviin sidosryhmiin ovat kriittisiä yrityksen toiminnan jatkuvuuden ja menestymisen kannalta. Yritysten liiketoimintaosaamiseen on jo kauan kuulunut sujuva yhteistyö lainsäätäjien ja viranomaisten kanssa. Monien muiden sidosryhmien tarpeet ovat kuitenkin usein jääneet huomiotta.

Luvussa 3 Andy Gouldson analysoi *ympäristösäätelytyylejä* ja niiden vaikutuksia yrityksiin. Yhdistyneissä Kuningaskunnissa yhteistoiminnallista ympäristösäätelytyyliä, jossa yritys ja viranomainen yhdessä sopivat yrityksen ympäristöpäästötavoitteet, on viime aikoina käytetty niihin yrityksiin, jotka pyrkivät noudattamaan ympäristölakeja. Reaktiivista, viranomaismääräyksiin perustuvaa ympäristösäätelytyyliä taas sovelletaan laeista piittaamattomiin ympäristöriskiyrityksiin.

Yhteistoiminnallinen säätelytyyli toimii silloin kun yritysten ja lainsäätäjien välillä on keskinäisiä riippuvuussuhteita ja muut sidosryhmät joko luottavat yrityksiin ja lainsäätäjiin tai suljetaan pois säätelyprosessista. Näin viranomaismääräyksiin perustuva, ympäristöstä huolestuneiden sidosryhmien etuja ajava säätelytyyli, on välimuoto yhteistoiminnallisen säätelytyylin kahden ääripään – sidosryhmien osoittaman luottamuksen ja sidosryhmien arvon mitätöimisen – välillä. Jos yritykset haluavat tulevaisuudessa sopia omat ympäristölupansa yhdessä viranomaisten kanssa, niiden on saavutettava muiden sidosryhmien luottamus pyrkimystensä kunniallisuudesta. Tämä vaatii herkkävaistoisia liiketoimintataitoja: avointa viestintää ja yhteistyöintoa kaikkien kiinnostuneiden sidosryhmien kanssa.

Yksi tapa rakentaa sidosryhmien luottamusta avoimen viestinnän kautta on yrityksissä yleistynyt tapa kertoa ympäristövaikutuksistaan ja -tavoitteistaan vuosittain julkaistavissa ympäristöraporteissa. *Luvussa 4* Iain Wright arvioi yritysten *ympäristöraportointia* Yhdistyneissä Kuningaskunnissa, Suomessa, muualla Euroopassa ja Yhdysvalloissa.

Ympäristöraportointia varten on syntynyt sekä vapaaehtoisia standardeja ja viitekehyksiä että pakollisen vuosittaisen tilintarkastuksen standardeihin sisällytettyjä vaatimuksia. Yritysten ympäristöraportit eivät kuitenkaan hyödynnä ympäristötaloustieteiden täsmällisyyttä ja logiikkaa, vaan ne kertovat usein vapaamuotoisesti yrityksen sen vuoden ympäristösaavutuksista pyrkien unohtamaan tai vähättelemään aiheutuneita ympäristöhaittoja. Jolleivät yritykset vapaaehtoisesti ala laatia avoimia ja luotettavia ympäristöraportteja, lain-

säätäjät tekevät siitä niille pakollisen työtehtävän. Yritysten oman edun mukaista on osoittaa halua ympäristövastuun ottamiseen myös tuottamalla sidosryhmilleen luotettavaa, käyttökelpoista ja vertailukelpoista tietoa vaikutuksistaan ympäristöön, suunnitelmistaan niiden vähentämiseksi, toiminnoistaan, joilla näihin tavoitteisiin on pyritty ja saavuttamistaan tuloksista.

Ympäristövaikutuksiltaan suurimmat yritykset ovat yleensä suuria kooltaankin, joten tottuneina raportoijina niillä on käytettävissään paljon raportointiosaamista sekä taloudelliset ja henkiset resurssit kehittää ympäristöraportoinnistaan yhtä täsmällistä ja loogista kuin taloudellisesta raportoinnistaankin. Arvopaperi- ja rahoitusmarkkinoilla kiinnostus yritysten ympäristöraportteihin on lisääntynyt, joten raportoinnissakin ympäristövastuu liittyy taloudelliseen vastuuseen. Ympäristöraportointi ei siis ole vain imagon kiillottamislaji, vaan todellinen liiketoimintaosaamisen muoto.

Ympäristöraportin tietojen tulisi kertoa yrityksen todellinen ympäristövaikutusten ja ympäristönsuojelun tilanne. Yritysten johdolla on usein epärealistinen kuva oman yrityksensä tilanteesta. Managerialinen asenne korostaa ympäristöjohtamisen tavoitteita ja tietoisia pyrkimyksiä, eikä välttämättä huomaa niiden eroa toteutuneisiin seurauksiin ja tahattomiin vaikutuksiin sekä yhteiskunnassa että luonnonympäristössä.

Luvussa 5 György Pataki tutkii *unkarilaisten yritysten vihertymistä* 1990-luvulla *kriittisen organisaatioteorian näkökulmasta* pohtien tavoitteellis-rationaalisen ympäristöjohtamisen mahdollisuuksia ja rajoja. Hän ottaa huomioon tarkoitukselliset ja tahattomat organisatoriset prosessit, tapahtumat ja tulkinnat, joilla on jotain ekologista relevanssia. Tämä artikkeli perustuu hänen väitöskirjaansa, joka valmistui vuonna 2002.

Modernit organisaatiot ja instrumentaaliset johtamis- ja organisaatiotieteet tarjoavat universaalia ratkaisua ympäristöongelmiin: vapaat markkinat tuottavat automaattisesti ekotehokkaan yhteiskunnan, jossa yritykset menestyvät modernin, tehokkaan byrokraattisen koneistonsa avulla, joka suoltaa vihreitä tuotteita ja palveluja. Tämä ekologinen modernisaatio välttää tai eliminoi keskustelut vallasta, hallitsevan tiedon vaaroista, etiikasta ja tunteista. Vaihtoehtoinen konstruktiivinen johtamisnäkemys antaa tilaa keskustelulle ja vaihtoehtoisille ratkaisuille ympäristöongelmiin. Yritysten liiketoimintaosaaminen ei ole mikään tehokkuusputki, jossa viiletellään laput silmillä, tai mikään hyökkäävän härän tarkasti pistävä sarvi, vaan yhteiskunnalliselle keskustelulle avoin foorumi ja sitä herkästi tulkitseva tuntosarvi. Yhteiskunnan eri toimijoiden monipuoliset ajatukset voivat tuoda aivan uudenlaisia ratkaisuja myös yritysten ympäristöongelmiin.

Yhteiskunnallisen herkkyyden lisäksi yritysten tulisi olla herkkiä myös yksilöiden tunteille ympäristöjohtamisessaan. Inhimillisten tunteiden huomiotta jättämisellä ympäristöjohtamisen arjessa saattaa olla ennalta arvaamat-

toman laajoja seurannaisvaikutuksia. Se voi johtaa yrityksen jopa katastrofin partaalle. *Luvussa 6* Tarja Ketola tarkastelee *organisaatioiden psykologisia puolustusmekanismeja ympäristökriiseissä*. Tämä artikkeli liittyy hänen vastuullisen liiketoiminnan diskurssianalyysitutkimukseensa, josta hän on kirjoittanut useita muitakin artikkeleita ja kirjan (Ketola 2005a).

Yritysten liiketoiminta on jatkuvaa tekemistä – ja tekevälle sattuu. Suurin osa ympäristöonnettomuuksista aiheutuu inhimillisestä erehdyksestä. Monet niistä olisi voitu estää, sillä yhtä onnettomuutta edeltää yleensä monta (jopa 30) läheltä piti -tilannetta. Nämä kuitenkin jäävät usein huomiotta, kun tekijä ei uskalla kertoa aiheuttamastaan vaaratilanteesta, työtoverit tai esimiehet eivät halua aiheuttaa tekijälle vaikeuksia ja/tai kaikki uskovat, ettei sellaista voi sattua uudelleen.

Kun ympäristöonnettomuus sitten kuitenkin realisoituu, niin samat tunteet voivat estää nopean korjaavan toiminnan. Tahdotaan olla niin kuin mitään ei olisi tapahtunutkaan ja toivotaan, ettei jäädä kiinni. Ihmisen psykologiset puolustusmekanismit voivat suojella syyllisrukkaa ja yrityksen muuta henkilöstöä teolta niin, että he todella uskovat, ettei mitään tapahtunutkaan. Ympäristöonnettomuuksissa todisteet ovat yleensä kuitenkin niin näkyviä, että syyllisten on pian pakko siirtyä kielloista selittelyihin: syy oli jonkun muun yrityksen. Kun sekin osoittautuu paikkansapitämättömäksi, koetetaan oikeuttaa tekoa esimerkiksi vähättelemällä tai rationalisoimalla sitä.

Onnettomuuden ympäristövaikutusten rajoittamisessa ja jälkien korjaamisessa kriittistä aikaa menee siis näiden inhimillisten puolustusmekanismien takia hukkaan. Jos yritys pystyisi organisaationa heti myöntämään tekonsa ja ottamaan siitä vastuun, tapahtuman ekologiset ja yhteiskunnalliset seuraukset voitaisiin minimoida. Yrityksen imago ei kärsisi, vaan se voisi saada jopa lisää glooriaa ripeästä vastuullisesta toiminnastaan.

Yrityksissä pitäisi siis oppia erottamaan inhimilliset yksilölliset tunteet ja organisaatiokäyttäytyminen toisistaan. Yksilöiden puolustuskäyttäytyminen on sisäänrakennettu mekanismi, jota ei voi muuttaa, mutta organisaation käytännöt voidaan sovittaa ottamaan niiden ilmestyminen kriisitilanteissa huomioon niin, että organisaatio toimii niistä riippumatta vastuullisesti. Tässä on haastetta yritysten liiketoimintaosaamiselle. Apua löytyy ihmistieteilijöistä. Monet suuret yritykset, kuten ydinvoimalat, ovat palkanneet psykologeja rakentamaan sellaista organisaatiota, joka estäisi inhimillisten tekijöiden vaikutukset onnettomuuksiin ja niistä lähtevät ketjureaktiot.

Ympäristötaloustiede tarjoaa siis liiketoimintaosaamiselle uusia malleja ja haasteita: kustannussäästöjä, liiketoimintamahdollisuuksia, lisävoittoja, imagoetuja ja vaikutusvaltaa hyötyjätekaupasta, ympäristölähtöisistä maantiekuljetuksista, ympäristösäätelytyyliin vaikuttamisesta, täsmällisestä ympäris-

töraportoinnista sekä herkkyydestä yhteiskunnan diskursseille ja yksilöiden tunteille.

Kokonaisuutena tämä kirja tarjoaa monipuolisen katsauksen siihen, millaisia instrumentteja ympäristötaloustieteellisillä tutkimuksilla on annettavana yritysten liiketoimintaosaamisen vahvistamiseen.

Lähteet

Ketola, T. (1991) *Ympäristöjohtaminen – Esimerkkinä Neste.* Turun kauppakorkeakoulun julkaisuja, Sarja D-3:1991.

Ketola, T. (2003) *10-vuotisseurantatutkimus: Nesteen/Fortumin ympäristöjohtaminen.* Helsingin kauppakorkeakoulun ympäristöjohtamisen pdf-julkaisusarja.

Ketola, T. (2005a) *Vastuullinen liiketoiminta: sanoista teoiksi.* Ilmestyy keväällä 2005. Edita: Helsinki.

Ketola, T. (2005b) *Nesteen/Fortumin ympäristöjohtaminen: 10-vuotisseurantatutkimus.* Turun kauppakorkeakoulun julkaisuja, Sarja A. Tulossa.

SISÄLLYS

1. TOISEN JÄTE ON TOISELLE RAAKA-AINE – HYÖTYJÄTEKAUPPA KIINNOSTAA YRITYKSIÄ

Nina Aarras

Abstrakti

Yritysten mielenkiintoa jätteiden hyötykäyttöä kohtaan on lisännyt paitsi tiukentunut jätealan sääntely, myös nousevat kaatopaikkamaksut ja jätevero. Taustalla vaikuttaa pyrkimys kustannussäästöjen aikaansaamiseen pienentämällä jätekuluja, sekä toisaalta kiinnostus hyötyjätteen kasvavia markkinoita kohtaan. Jätteiden hävittäminen on yritykselle kustannustekijä, joten jäteasioiden järjestämisellä on vaikutusta myös yrityksen kilpailukykyyn. Tästä huolimatta suuri määrä käyttökelpoista jätemateriaalia päätyy yrityksistä kaatopaikoille sen sijaan, että tätä materiaalia voitaisiin ostaa ja myydä uudelleenkäyttöä varten. Hyötyjätekaupan näkökulmasta katsottuna jäte on oikeastaan vain väärässä paikassa olevaa raaka-ainetta.

1.1 Johdanto

Kaatopaikkojen sulkeminen, nousevat kaatopaikkamaksut ja jätevero ovat kasvattaneet yritysten kiinnostusta jätteiden kierrätykseen ja hyötykäyttöön. Yritysten mielenkiintoa jätteiden hyötykäyttöön ovat lisänneet muun muassa pyrkimys kaatopaikkakuormituksen vähentämiseen sekä toisaalta kustannussäästöjen aikaansaaminen pienentämällä raaka-aine-, jäte- ja energiakuluja. Taustalla vaikuttavat osaltaan myös imagosyyt sekä toisaalta yritysten mielenkiinto hyötyjätteen kasvavia koti- ja vientimarkkinoita kohtaan. Lisäksi yrityksiä velvoittava jätealan sääntely on viime vuosina lisääntynyt huomattavasti. Tiukentuneet kierrätysvelvoitteet ovatkin yllättäen nostaneet jätteen arvotavaraksi. Hyötykäytön näkökulmasta jäte on oikeastaan vain väärässä paikassa olevaa raaka-ainetta.

Miten yhden yrityksen toiminnassa syntynyt jäte voitaisiin paremmin hyödyntää toisen yrityksen raaka-aineena? Tähän teollisen ekologian ajattelumalliin liittyviä yritystoiminnan mahdollisuuksia on tutkittu liiketaloudellisesta näkökulmasta varsin vähän, vaikka EU:n ympäristönsuojeludirektiivien ja kansallisen ympäristölainsäädännön tiukentuessa potentiaalia yritystoiminnasta syntyvien jätteiden uudelleenkäyttöön liiketoiminnallisessa mielessä on yhä enemmän. Jätteiden hävittäminen on yritykselle kustannustekijä, joten

jäteasioiden järjestämisellä on vaikutusta myös yrityksen kilpailukykyyn (Callenbach et al 1993, 14–15).

Keskeinen kysymys onkin, miksi niin paljon käyttökelpoista materiaalia päätyy yrityksistä jätteenkäsittelylaitoksiin ja kaatopaikalle sen sijaan, että tätä materiaalia voitaisiin myydä ja ostaa uudelleenkäyttöä varten. Yrityksissä näyttäisi olevan kiinnostusta hyötyjätekauppaan, mutta käytännössä toimintaan ryhtymistä saattaa hankaloittaa muun muassa monimutkaiselta vaikuttava lupabyrokratia, vaikeus löytää sopivia kumppaneita, sijainti- ja logistiikkakysymykset sekä houkutus pitäytyä vanhoissa ajattelu- ja toimintamalleissa.

1.2 Jätealan sääntely tuo lisää vastuuta yrityksille

Suomen nykyinen jätteitä koskeva lainsäädäntö perustuu pääosin Euroopan unionin säädöksille. Nykyisen jo varsin runsaan säädöstön lisäksi Euroopan unionin piirissä on valmisteilla useita uusia jätealan säädöksiä ja nykyisiin säädöksiin tehtäviä tarkistuksia. Tässä kehityksessä yhtenä trendinä voidaan nähdä jätehuoltovastuun siirtäminen tuottajille. Tuottajan vastuu – periaatetta mukailevassa jätehuollossa tuotteen valmistajan velvollisuutena on järjestää ja/tai kustantaa tuotteiden uudelleenkäyttö, hyödyntäminen jätteenä ja jätteiden turvallinen loppusijoitus. Keskeisenä ajatuksena on ollut siirtää jätehuoltovastuu sille taholle, jolla on mahdollisuus vaikuttaa tuotteiden ominaisuuksiin: Yritys joka maksaa itse tuotteensa uudelleenkäytön ja jätehuollon, on myös motivoitunut suunnittelemaan tuotteensa niin, että se on vähän jätteitä tuottava, uudelleenkäytettävä ja helposti kierrätettävä ja lopuksi haitattomasti kaatopaikalle sijoitettava. (Euroopan parlamentti 2001.)

Suomessa valtaosa jätteistä (noin 95 %) syntyy tuotannossa. Tuotannon jätteistä pääosa on peräisin teollisesta toiminnasta ja maataloudesta. Suomessa vuosittain muodostuvasta noin 70 miljoonan tonnin kokonaisjätemäärästä noin 60 % syntyy teollisessa toiminnassa, jolla tässä tarkoitetaan kaivostoimintaa, teollisuutta ja energiahuoltoa. Maaseutuelinkeinojen osuus on puolestaan noin 25%, talonrakentamisen noin 10% ja yhdyskuntien noin 5%. (Suomen ympäristökeskus 2004.)

Kun yritysten jätteitä koskeva sääntely tulee mitä todennäköisemmin kiristymään ja samalla tuomaan lisää vastuuta yrityksille, voi hyötyjätekauppa antaa tällöin yrityksille mahdollisuuden vastata lisääntyviin velvoitteisiin sekä toisaalta ennakoida kaatopaikka- ja jätteenkäsittelymaksujen nousua. Jätteen hyödyntämisessä ja materiaalikuluissa saavutetut säästöt voivat synnyttää yrityksissä merkittävää taloudellista hyötyä. Toisaalta hyötyjätekauppa voidaan

nähdä myös kannattavana liiketoimintana, jolla on mielenkiintoiset tulevaisuudennäkymät. Hyötyjätekaupalla tarkoitetaan tässä jätteiden ostamiseen, myymiseen tai välittämiseen liittyvää toimintaa. Hyötyjäteketjun rakenne voi muodostua myyjä-ostajaketjusta tai myyjä-välittäjä-ostaja ketjusta. Välittävä yritys voi olla keskittynyt esimerkiksi hyötyjätteen käsittelyyn, kuljetukseen tai yksinomaan kauppojen järjestämiseen. Toiminta voi olla jatkuvaa tai vaihtoehtoisesti painottua johonkin tiettyyn sesonkiin.

1.3 Jätettä vai uusioraaka-ainetta?

Höytyjätekaupan ideologinen tausta kytkeytyy läheisesti teollisen ekologian (industrial ecology) teoreettisiin periaatteisiin. Teollisuusekologinen ajattelumalli perustuu näkemykseen, jonka mukaan teollisten järjestelmien tulisi jäljitellä ekosysteemejä. Ekosysteemeille tyypillisiä piirteitä ovat niiden energian ja materiaalien käytön tehokkuus ja että systeemin osat hyödyntävät toistensa ”jätteitä”. (Graedel – Allenby 1995, 8–9). Teollisen ekologian ideana on siis pyrkiä kehittämään tuotantojärjestelmiä luonnonjärjestelmien mallin mukaisesti niin, että yhden tuotannonalan ”jäte” käytetään toisen tuotannonalan raaka-aineena.

Jätteen määritelmä on osaltaan kuitenkin ongelmallinen. Milloin voidaan puhua jätteestä, milloin taas uusioraaka-aineesta? Aineen tai esineen luokittelussa jätteeksi noudatetaan jätelain 3§:n mukaista määritelmää, jonka mukaan jätteellä tarkoitetaan: *"ainetta tai esinettä, jonka sen haltija on poistanut tai aikoo poistaa käytöstä taikka on velvollinen poistamaan käytöstä”*. Jätteen määritelmä perustuu EY-lainsäädännössä olevaan vastaavaan määritelmään, jonka tulkinnasta ei ole kuitenkaan toistaiseksi käytössä yhtenäisiä kriteerejä. EU:n tuomioistuimessa on viime vuosina ratkaistu useita jätteen määritelmän tulkintaan liittyviä oikeustapauksia. Tuomioistuinkäytännön mukaan jätteen määritelmää on tulkittava laajasti, eli ennakkoratkaisujen perusteella monissa yrityksissä termeillä sivutuote, rinnakkaistuote tai jäteraaka-aine kutsutut esineet tai aineet on pääsääntöisesti luokiteltava jätteiksi (Merilehto – Rytkönen 2001, 10).

Jätteeksi luokittelu on kuitenkin monille yrityksille hankala asia, koska se antaa helposti tuotteesta negatiivisen mielikuvan ja vaikuttaa tätä kautta tuotteen hintaan ja asiakkaiden kiinnostukseen. Yritysten huolena on, että jätteiden hyödyntäminen uusioraaka-aineena hankaloituu, koska vastaanottajat eivät halua käyttää jätteeksi luokiteltuja esineitä ja aineita raaka-aineinaan. Hyötyjätekauppa voidaan mieltää hankalaksi myös jätteisiin liittyvien lupamenettelyjen ja viranomaiskäsittelyjen vuoksi. Jätteen laitos- tai ammattimaiseen hyödyntämiseen tai käsittelyyn tarvitaan ympäristölupa (YSL 28§). Lisäksi toi-

minnanharjoittajan on tehtävä ilmoitus alueelliselle ympäristökeskukselle muun muassa jätteen myyjänä tai välittäjänä toimimisesta, jos jäte on tarkoitettu hyödynnettäväksi tai käsiteltäväksi Suomen alueen ulkopuolella (JäteL 49§).

Jätteiden kansainvälisissä siirroissa sovelletaan niin sanottua EY:n jätteensiirtoasetusta, jossa on säädetty yksityiskohtaisesti jätteiden viennin, tuonnin ja kauttakuljetuksen tarvittavista luvista. Kun yrityksen tuote määritelläänkin jätteeksi, saattaa se hankaloittaa olennaisesti tuotteen vientiä ulkomaille. Imagoriskin lisäksi jätteiden vientiin liittyvä byrokratia voi aiheuttaa yllätyksiä. Joihinkin maihin vienti voi jopa estyä, koska jätteiksi luokiteltuja materiaaleja ei voida siirtää maasta toiseen. Jätteen määritelmästä on käyty keskustelua kansainvälisillä areenoilla jo kohta kolmen vuosikymmenen ajan.

Allen ja Behmanesh (1994) ovat esittäneet näkemyksen, jonka mukaan esimerkiksi teollisuuden prosesseissa syntyviä ei-toivottuja sivutuotteita ei tulisikaan pitää jätteinä lainkaan, vaan ne tulisi ymmärtää monesti aivan liian aliarvostettuina raaka-aineina. Allen ja Behmaneshin mukaan teollisen ekologian keskeisin haaste onkin identifioida uusia hyötykäyttötapoja sellaisille materiaaleille, joita tällä hetkellä pidetään ainoastaan käyttökelvottomana jätteenä.

1.4 Hyötyjätekauppa on kannattava vaihtoehto

Miksi yritysten sitten tulisi harkita raaka-aineidensa ostamista tai jätteidensä myymistä hyötyjätekaupassa? Ensinnäkin siksi, että se on yrityksen tuotannollisen tehokkuuden kannalta edullista. Sellaisissa maissa, joissa jätteiden hävittäminen on suhteellisen halpaa ja sääntely vähäistä, ei pyrkimys kaatopaikalle päätyvien jätteiden määrän vähentämiseen hyötykäytöllä ole yrityksessä kovin merkittävässä asemassa. Erityisesti suuremmissa yrityksissä tämä voi kuitenkin johtaa tehottomuuteen ja näin myös tuottavuuden heikentymiseen. Ei ole siis sattumaa, että monet maailman kilpailukykyisimmistä tuotantoyrityksistä näyttävät sijaitsevan maissa, joissa jätteiden hävittäminen on suhteellisen kallista. Jäteasioiden hyvä hoito näkyy tuotannon tehokkuutena ja sitä kautta myös kustannussäästöinä.

Toiseksi jätteet aiheuttavat yrityksille merkittäviä kustannuksia. Jäteasioihin liittyvät kustannukset näkyvät yrityksen kirjanpidossa tavallisimmin kuljetus- ja kaatopaikkamaksuina. Tosiasiassa yritysten jäteasioiden hoitoon liittyy huomattava määrä piilokustannuksia. Esimerkiksi jätteiden varastointi (esimerkiksi tilat, laitteet ja kalusto), jätteiden käsittelyyn käytetty työaika, vesi ja energia (esimerkiksi puhtaanapito), jätteessä menetetty raaka-aine sekä hallinnolliset asiat (esimerkiksi lupa- ja ilmoitusasiat sekä tarkastukset) aiheuttavat

yrityksille kuluja, joita ei yrityksissä välttämättä yhdistetä jätekysymyksiin. Joidenkin arvioiden mukaan jätteestä syntyvät piilokustannukset ovat viisi, tai jopa kymmenkertaiset pelkkiin jätteiden hävityskustannuksiin nähden. Jäteasioiden suunnitelmallinen hallinta on monessa yrityksessä vasta lapsen kengissä, koska jätteitä ei nähdä osana toiminnallista kokonaisuutta.

Kolmanneksi kaatopaikoille päätyvät jätteet ovat luonnonvarojen tuhlausta. Teollisuuden ja Työnantajain Keskusliiton jäsenyrityksilleen tekemässä kyselytutkimuksessa (2001) selvitettiin PKT -yritysten tilannetta ja näkemyksiä ympäristöasioissa. Tutkimuksen mukaan jätteiden hyödyntäminen ja materiaalitehokkuus ovat PKT -yrityksissä ympäristönsuojelun tärkeimpiä kehittämiskohteita. Markkinat vaikuttavat yhä enemmän yritysten ympäristötekoihin ja tässä kehityksessä yritysten on samalla pystyttävä vastaamaan niin asiakkaidensa tarpeisiin kuin lainsäädäntöön perustuviin viranomaisvaatimuksiinkin. Tutkimuksen mukaan yritykset etsivät aktiivisesti keinoja, joilla kaatopaikoille menevää jätettä voitaisiin vähentää ja saada toiminnasta syntyvä jäte hyötykäyttöön. (Teollisuus ja Työnantajat 2001, 4–8.)

Neljänneksi hyötyjätekauppa on kasvubisnes. Esimerkiksi metalliromun tuonti Venäjältä Suomeen on kasvanut moninkertaiseksi viimeisen kymmenen vuoden aikana. Vuonna 2002 Venäjältä tuodun romun määrä ylsi jopa noin puoleen miljoonaan tonniin ja ennakkotietojen perusteella näyttäisi siltä, että määrä oli tätäkin suurempi vuonna 2003. Romua tuodaan Suomeen metalliteollisuuden raaka-ainetarpeisiin. (Tilastokeskus 2004.) Lisäksi jätealan kasvuodotuksia heijastelee myös yritysten investointihalukkuus jätteitä hyödyntäviin laitoksiin. Esimerkiksi Suomen suurin jäteyhtiö investoi yli viisi miljoonaa euroa tuotantolaitokseen, joka valmistaa ongelmajätteistä kierrätysraaka-aineita teollisuudelle (Ympäristö 2003, 13). Tällä hetkellä jätealan tärkein kasvumoottori on lainsäädäntö, joka tuo jatkuvasti uusia ympäristövelvoitteita eri toimijoille. Markkinoiden yleisnäkymät hyötyjätealalla näyttäisivät olevan siis varsin suotuisat.

Säännöstelyn tiukentumisesta, nousevista kustannuksista ja lisääntyvästä ympäristötietoisuudesta huolimatta vasta harva yritys ymmärtää jätekysymykset osana toimintansa strategista kokonaisuutta tai näkee hyötyjätekaupan potentiaalisena liiketoimintana. On voitu huomata, että yritykset jotka toimivat asiakaslähtöisesti, tekevät pitkän tähtäimen suunnitelmia ja pyrkivät aggressiivisesti parempaan tulokseen, ovat keskimääräistä alttiimpia omaksumaan uusia ideoita ja teknologioita. Nämä yritykset ovat myös kiinnostuneempia mukauttamaan teollisen ekologian ajattelumallien mukaisia järjestelmiä yritysrakenteeseensa verrattuna niihin yrityksiin, jotka tyytyvät pelkästään noudattamaan säädöksiä. (Graedel – Allenby 1995, 295.)

1.5 Teollinen ekologia yrityksessä

1.5.1 Tuotteesta hyötyjätteeksi -elinkiertoajattelu haastaa perinteiset toimintamallit

Yhä useampi yritys joutuu siis kantamaan vastuuta valmistamasta tuotteestaan myös myynnin jälkeen. Tämä puolestaan johtaa siihen, että yritys joutuu tekemään yhteistyötä jalostusketjun myöhempien osapuolten kanssa. Ketjun eri vaiheissa toimivien yritysten on yhteistyössä selvitettävä ja ratkaistava, mitä tuotteelle tapahtuu varsinaisen käytön jälkeen. Kenties haastavin tehtävä monen yrityksen perinteisiin ajattelutapoihin nähden on pyrkimys tuotteiden koko ”elinkaaren” (tai ehkä oikeammin elinkierron, Product Life Cycle) hahmottamiseen. Elinkierto ulottuu raaka-aineiden hankinnasta, jalostuksesta, valmistuksesta, jakelusta, kaupasta ja kulutuksesta aina materiaalin kierrätykseen tai hävittämiseen saakka. (Räsänen 1994, 168.)

Tämän kaltaisella systeemiajattelulla on kuitenkin omat heikkoutensa. Monessa tapauksessa tarkasteltavassa ketjussa toimivat yritykset saattavat sijaita aivan eri maissa tai maanosissa. Todellisuudessa yksikään päätöksentekijä ei ole sellaisessa asemassa, että hänen olisi mahdollista hallita niin laajoja järjestelmiä niin yksityiskohtaisesti. Yhdelläkään yrityksellä ei ole sellaista valtaa, että sillä olisi mahdollisuus optimoida koko järjestelmää. Viranomaiset voivat omalta osaltaan toki luoda edellytyksiä ja asettaa määräyksiä, mutta eivät kuitenkaan junailla yksittäisten tuotteiden elinkiertoa. (Heiskanen 2004, 137.) Kukin yritys voi kuitenkin vaikuttaa omiin asioihinsa, kuten esimerkiksi mitä raaka-ainetta se ostaa ja mitä syntyneelle jätteelle tehdään. Vaikka elinkiertoajattelun lintuperspektiivi kuuluukin mallien keinotekoiseen maailmaan, on hyötyjätekauppoja suunnittelevan yrityksen hyvä olla tietoinen materiaalikierron kokonaisuuksista. Tuotantoketjun tunteminen voi nostaa esiin uusia näkökohtia jäteasioidensa järjestämistä pohtivalle yritykselle.

1.5.2 Yhteistyö luo edellytykset toimivalle kokonaisuudelle

Hyötyjäteketjujen ja -verkostojen onnistunut rakentaminen ja kehittäminen edellyttää hyviä suhteita yritysten, viranomaisten sekä päättäjien välillä. Tarpeetonta vastakkain asettelua tulisi pyrkiä välttämään, koska toimiva kokonaisuus edellyttää yhteistyöhalukkuutta niin yritysten kuin julkisen sektorin puolelta. Jätehuolto elää tällä hetkellä voimakkaassa muutosvaiheessa. EU:n kierrätysvelvoitteet ja markkinaehtoisen kierrätyskilpailun herääminen ovat mullistaneet markkinoita niin nopeaan tahtiin, että lainsäädäntö ja eri kuntien käytännöt eivät tahdo pysyä perässä.

Yrityspuolen näkemys on, että kaikki jätteet on oltava vapaasti hyödynnettävissä, jotta jätteiden kierrätys- ja hyötykäyttölaitoksiin voidaan investoida. Toisin sanoen asiakkaan tulisi saada päättää, kenelle jätteensä luovuttaa. Kuntapuolella kuitenkin pelätään, että tällaisessa mallissa kunnille lankeaa vain sellaiset erät, joita kukaan muu ei halua. Julkisen puolen näkemyksen mukaan kunnallisten ja sopimusperusteisten järjestelmien tulisi olla tasavertaisia myös jatkossa. Esimerkkejä yritysten ja kunnallisten toimijoiden onnistuneesta yhteistyöstä on jo olemassa, eli tasavertaisuusmalli näyttäisi toimivan käytännössäkin. Myös kilpailuvirasto on pitänyt tärkeänä sitä, että jätteille luodaan mahdollisimman hyvin toimivat markkinaolosuhteet. Uusien toimintamallien kirjoittaminen säännöiksi on kuitenkin usein verrattain hankalaa. Tärkeintä on, että kaikki asianosaiset tietävät millaisille periaatteille tulevaisuutta rakennetaan. (Gröndhal 2004)

1.5.3 Toimiva hyödyntäminen edellyttää hyvää sijaintia

Toinen keskeinen kysymys hyötyjätekaupasta puhuttaessa on jätteen myyjän ja ostajan maantieteellisen sijainnin vaikutus. Hyötykäytön näkökulmasta jäte on raaka-ainetta, joka pitää vain saada kustannustehokkaasti oikeaan paikkaan. Suomelle ovat tunnusomaisia pitkät välimatkat, mutta esimerkiksi teollisuusyritykset sijaitsevat paikallisella tasolla monesti melko keskitetysti teollisuusalueilla. Teollisen ekologian ajattelumallia voidaan helpoiten soveltaa nimenomaan sellaisissa tapauksissa, joissa jätteiden hyödyntämiseen liittyviin ongelmiin etsitään paikallisia ratkaisuja. Kynnys jätteiden hyötykäyttöön on erityisen matala silloin, kun jätteitä voidaan hyödyntää lähellä niiden syntypaikkaa, eli silloin kun kuljetuskustannukset minimoituvat. Edistyksellisen tuotantoyrityksen saattaisikin olla viisasta jo sijaintipäätöstä tehdessään ottaa huomioon paitsi raaka-aineiden ja markkinoiden läheisyys, myös yritystoiminnan tuottamien jätteiden eteenpäin myynnin, luovuttamisen tai hävittämisen mahdollisuudet lähialueella.

Hienostuneimmillaan teollisen ekologian malli voi realisoitua yritysten paikallisena kierrätysverkostona, jossa toimijat hyödyntävät toistensa jätemateriaalin ja jäte-energian yhteistyöllä. Itse asiassa tällöin voidaan puhua jo teollisesta ekosysteemistä (industrial ecosystem, Korhonen 2000). Teollinen ekosysteemi poikkeaa perinteisestä yhden tuotteen tai jätevirran kierrättämisestä ja keskittyy sen sijaan monen eri jätevirran hyödyntämiseen monen eri yrityksen välillä paikallisessa yhteistyössä. Edellä kuvatun kaltainen teollinen ekosysteemi on varsin kunnianhimoinen käsite, ja tällä hetkellä siitä hyödytään kenties parhaiten keskustelun herättämisen mielessä. Mallin testaaminen käytännössä on vasta aluillaan ja kysymykseen sen yleistettävyydestä löytyy tie-

tenkin argumentteja puolesta ja vastaan. Teollisten järjestelmien ja yritysverkostojen kehittäminen kierrätykseen perustuviksi on tietysti helpompaa maissa, joissa on vähän ihmisiä ja runsaasti luonnonvaroja, kuten esimerkiksi Suomessa. Jokainen alueellinen yritysverkosto on kuitenkin ainutlaatuinen omine ekologisine, taloudellisine ja sosiaalisine tai kulttuurisine ominaisuuksineen eikä verkostoa tietenkään voida rakentaa tyhjästä.

1.6 Hyötyjätealan tulevaisuus

Minkälaiset ovat hyötyjätealan tulevaisuuden näkymät tällä hetkellä? Jätealan tulevaisuuden trendejä on tutkittu jonkin verran, mutta yritysten kehittämistoimintaa tukevaan ennakointiin liittyviä tutkimustuloksia on saatavilla varsin niukasti. Loikala (2003) on tarkastellut jätehuollon tulevaisuuden megatrendejä EU-alueella. Loikalan mukaan jäteverotus tulee kiristymään tulevaisuudessa, minkä seurauksena perinteinen kaatopaikkakäsittely muuttuu epätaloudelliseksi ratkaisuksi. Tämä puolestaan johtaa kierrätyksen ja hyötykäytön lisääntymiseen, jonka seurauksena investoinnit, käyttö- ja pääomakustannukset sekä myös jätetaksat nousevat. Kehityksen seurauksena kilpailu toimijoiden talteen ottamien lopputuotteiden välillä lisääntyy ja kiristyy, mikä puolestaan tukee jätteiden asianmukaista käsittelyä ja laadukkaita lopputuotteita.

Myös Granqvistin ja Kailan (1999) mukaan jätealalla on todettavissa muutamia megatrendejä, jotka puolestaan ohjaavat jätealan kotimaan markkinoita. Heidän mukaansa jätteiden synnyn ehkäisystä tulee yrityksille kilpailuetua luova tekijä ja samalla jäteraaka-aineiden arvo kasvaa ja kiinnostus niitä kohtaan lisääntyy. Hyötyjätealan tulevaisuudennäkymät vaikuttavat siis varsin mielenkiintoisilta. Potentiaalia yritystoiminnasta syntyvien jätteiden uudelleenkäyttöön liiketoiminnallisessa mielessä on yhä enemmän.

Ympäristöasioiden ja yritysten taloudellisten näkökohtien sovittaminen yhteen on ollut ja tulee tulevaisuudessakin olemaan tärkeimpiä kysymyksiä ympäristönsuojelun edistämisessä. Jätteiden hyötykäyttöä hidastavat tekijät eivät tänä päivänä ole niinkään teknisiä ongelmia, vaan taloudelliseen kannattavuuteen liittyviä kysymyksiä, yhteistyön kankeutta sekä tietysti jonkin verran parannettavaa löytyy myös asennepuolella. ”Jätepuuhiin” saatetaan suhtautua hieman naureskellen, vaikka todellisuudessa naureskelija ei välttämättä osaisi erottaa, onko tuote valmistettu jäteraaka-aineesta vai jostakin muusta. Selvältä kuitenkin näyttää, että jätteiden sijoittaminen kaatopaikoille on tulevaisuudessa yhä huonompi vaihtoehto niin ympäristön kuin taloudellisen kannattavuuden näkökulmasta. Tässä kehityksessä ne yritykset, jotka osaavat ennakoida toimintaympäristönsä muutoksia saavat etulyöntiaseman tilan-

teessa, jolloin muut vasta heräävät huomaamaan hyötyjätekaupan mahdollisuudet.

Lähteet

Allen, D.T. –Behmanesh, N. (1994) Wastes as raw materials. In: *The Greening of Industrial Ecosystems*, ed. by B.R. Allenby – D.J. Richards, 69–89. National Academy Press: Washington, DC.

Callenbach, E. – Capra, F. – Goldman, L. – Lutz, R. – Marburg, S. (1993) *EcoManagement. The Elmwood Guide to Ecological Auditing and Sustainable Business.* Berrett-Koehler Publishers: San Francisco.

Euroopan parlamentti: Teollisuus-, ulkomaankauppa-, tutkimus- ja energiavaliokunta (2001) *Lausunto ympäristöasioiden, kansanterveyden ja kuluttajapolitiikan valiokunnalle*. 2000/0159(COD) Valmistelija: Nuala Ahern

Graedel, T. – Allenby, B. (1995) *Industrial Ecology*. Prentice-Hall. A Simon & Schuster Company: New Jersey.

Granqvist, J. – Kaila, J. (1999) *Esiselvitys jätehuollon teknologian kehitystarpeista*. VTT –yhdyskuntatekniikka, tutkimusraportti 492. Espoo.

Gröndahl, J. (2004) Taistelu jätteen omistuksesta. *Helsingin Sanomat*: *Talous & Työ*, 4.7.2004.

Heiskanen, E. (2004) Elinkaariarvioinnit ja elinkaariajattelu. Teoksessa: *Ympäristö ja liiketoiminta*. *Arkiset käytännöt ja kriittiset kysymykset*, toim. E. Heiskanen. Gaudeamus: Helsinki.

Kautto, P. – Melanen, M. – Saarikoski, H. – Ilomäki, M. – Yli-Kauppila, H. (2000) *Suomen jätepolitiikan ohjauskeinot -vaikutukset, vaikuttavuus ja kehittämistarpeet*. Suomen ympäristö 430. Suomen ympäristökeskus: Helsinki.

Korhonen, J. (2000) *Industrial Ecosystem: Using the material and energy flow model of an ecosystem in an industrial system*. Jyväskylä Studies in Business and Economics 5.

Loikala, J. (2003) *Jätehuollon tulevaisuuden näkymät EU-alueella*. Finpro.

Merilehto, K. – Rytkönen, T. (2001) *Opas jätetietoa toimittavalle VAHTI-asiakkaalle*. Suomen ympäristökeskuksen moniste 225. Suomen ympäristökeskus: Helsinki.

Räsänen, K. (1994) *Kehittyvä liiketoiminta: Haaste tulevaisuuden osaajille*. Weilin + Göös: Espoo.

Suomen ympäristökeskus (2004). Jätemäärät Suomessa. www.ymparisto.fi 11.10.2004 (Päivitetty)

Teollisuus ja Työnantajat (2001) *PKT -yritysten ympäristöhaasteet 2001*.

Tilastokeskus (2004) *Aiempaa vähemmän yhdyskuntajätettä kaatopaikoille.* www.stat.fi 21.12.2004

Ympäristö (2003) Ongelmajätteistä raaka-aineiksi. *Ympäristö* 7/2003.

2. MAANTIEKULJETUSYRITYKSEN YMPÄRISTÖLÄHTÖISEN KILPAILUKYVYN MALLI

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Abstrakti

Tämä artikkeli perustuu kirjoittajan väitöskirjaan *Maantiekuljetusyrityksen ympäristölähtöinen kilpailukyky* (ks. Stenholm 2004). Artikkelissa käsitellään maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn mallia ja ympäristölähtöiseen kilpailukykyyn vaikuttavia tekijöitä. Stenholmin tutkimuksessa kehitetyllä ja testatulla maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn mallilla kyettiin osoittamaan, että maantiekuljetusyrityksen ympäristölähtöinen kilpailukyky pohjautuu yrityksen ympäristöosaamiseen, yrityksen yli ulottuviin prosesseihin sekä asiakkaiden ja yhteistyökumppaneiden kanssa tapahtuvaan yhteistyöhön enemmän kuin käytössä olevaan kuljetuskalustoon. Näillä keinoin maantiekuljetusyrityksen on mahdollista parantaa kilpailukykyään ja ympäristölähtöisyyttään alati kovenevassa kilpailussa. Samalla kyetään parantamaan maantiekuljetusten ympäristölähtöisyyttä yleisesti.

2.1 Johdanto

Yritystoiminta on eräs ekologisen järjestelmän alajärjestelmä, joka on riippuvainen muista ekologisista järjestelmistä. Yritys tarvitsee liiketoimintaympäristöä selviytyäkseen. Liiketoimintaympäristö puolestaan tarvitsee yhteiskuntaa, yhteiskunta ihmisjärjestelmää[1] ja ihmisjärjestelmä ekosysteemiä. Toiseen suuntaan jatkumo ei ole näin pitkä, sillä ekosysteemi ei ole riippuvainen yritystoiminnasta. (Jennings – Zandbergen 1995, 1015; Ketola 1999, 36–37.)

Yrityksiin liittyvissä tutkimuksissa yrityksen ympäristö käsitetään tyypillisesti markkinoiden, toimialojen ja kilpailijoiden muodostamaksi kokonaisuudeksi. (Bartels 1976, 206–212; Shrivastava 1995, 125). Tällaisissa tarkasteluissa yritystä ympäröivän luonnonympäristön ja yritystoiminnan välille ei muodostu yhteyttä (Jennings – Zandbergen 1995, 1015; Hoffman 2001, 26–30). Yritystoiminnan haitalliset ympäristövaikutukset tiedostetaan, mutta liiketaloudellisia tavoitteita, kuten voiton maksimointia tai vaatimuksia edulli-

[1] Ihmisjärjestelmä on osa ekosysteemin alajärjestelmiä, joka sisältää fyysisen, psyykkisen ja yhteiskunnallisen järjestelmän (Ketola 1999, 36).

simmista tuotteista tai palveluista, painotetaan enemmän kuin ympäristölähtöisyyden kehittämistä (Kallio 2000 16).

Yrityksen toiminnoista logistiikalla on suuri vaikutus yritystoiminnan synnyttämiin haitallisiin ympäristövaikutuksiin (Murphy et al 1995, 6; Wu – Dunn 1995, 22; Rodrigue et al 2001, 2). Logistiikan ja ympäristön välisen suhteen tutkimusperinne on kuitenkin kapea (Murphy et al 1994, 49; Carter – Ellram 1998, 89–90). Logistiikan liiketaloustieteellisen tutkimuksen painopisteenä on usein tutkia asiakkaalle suuntautuvia toimitusketjuja ja niiden osatekijöitä, kuten asiakastyytyväisyyttä, toimitusketjun hallintaa ja kansainvälistä logistiikkaa (Stock 2001, 132–133). Tavoitteena on löytää ratkaisuja kustannusten minimoimiseksi ja tuottojen maksimoimiseksi tai siihen, miten logistiikasta saadaan nopeampaa, joustavampaa ja laadukkaampaa (Wu – Dunn 1995, 24; Murphy – Poist 2000, 6). Tällaisen tutkimuksen tavoitteet eivät ole puutteellisia tai virheellisiä, mutta niistä puuttuu ulottuvuus logistiikan ja ympäristön välisestä suhteesta.

Haasteellista logistiikan ympäristövaikutusten vähentämisestä tekee logistiikan välttämättömyys. Logistiikalla pyritään ylittämään ajallisia ja maantieteellisiä välimatkoja mahdollisimman taloudellisesti ja laadukkaasti. Yrityksen toimialasta riippumatta resurssien, tuotannon ja asiakkaiden alueellinen jakautuminen edellyttää logistiikkaa eli toimivia materiaali-, informaatio- ja pääomavirtoja. (Ballou 1987, 6–10.) Tässä kokonaisuudessa logistiikan ympäristövaikutukset syntyvät logististen toimintojen ja ympäristön välisessä vuorovaikutuksessa. Jokainen logistinen toiminto on vuorovaikutussuhteessa ympäristöön (Bloemhof-Ruwaard et al 1995, 231).

Logistiikan ja ympäristön välisen tarkastelun puutetta voi osaltaan selittää logistiikan ympäristövaikutusten selvittämisen vaikeus. Logistiikan ympäristövaikutusten selvittäminen ja hallitseminen on vaikeaa, koska ne edellyttävät sekä yrityksen jokaisen logistisen toiminnon erillistä (Enarsson 1998, 5) että logististen toimintojen muodostaman kokonaisuuden, toimitusketjun, samanaikaista tarkastelua (Crosbie – Knight 1995, 188; Wu – Dunn 1995, 22–23). Ympäristölähtöisen logistiikan lähtökohtana on se, että ympäristövaikutuksia pyrittäisiin vähentämään jo siinä vaiheessa, kun hyödykkeet siirtyvät toimitusketjussa kohti loppukäyttäjää (Wu – Dunn 1995, 23; McIntyre et al 1998, 58). Toimitusketjun lopussa monet ympäristövaikutusten kannalta olennaiset tuote- ja tuotantopäätökset on jo tehty, jolloin loppupään logistisissa toiminnoissa ympäristövaikutuksiin voidaan vaikuttaa enää vain vähän (Linnanen – Markkanen 1997, 65–66).

Ympäristön kannalta parhaimman toimitusketjun tai logistiikan toteuttaminen ei kuitenkaan ole kenenkään suoranainen intressi, jolloin on usein tyydyttävä kehittämään nykyistä toimintaa mahdollisimman ympäristölähtöiseksi. Logistiikan kehityssuunnat eivät olekaan olleet ympäristön kannalta edullisia.

Esimerkiksi tuotannon erikoistuminen, tuotantomenetelmien uusiutuminen ja varastojen keskittäminen ovat lisänneet muun muassa kuljetusten ja erityisesti maantiekuljetusten määrää (Suutari 1999, 13). Kuljetukset ovatkin logistisista toiminnoista näkyvin ja ympäristövaikutuksiltaan merkittävin toiminto, johon liittyvät päätökset ovat sidoksissa käytettäviin jakeluteihin, varastointikäytäntöihin ja kuljettavien hyödykkeiden kysyntään (Coyle et al 1990, 40).

Tässä tutkimuksessa keskitytään maantiekuljetusten ja erityisesti maantiekuljetusyritysten ympäristölähtöisen toiminnan kehittämisen tarkasteltuun. Tutkimuksen tarkoituksena on kuvata maantiekuljetusyrityksen ympäristölähtöinen kilpailukyvyn malli ja tutkia mihin tekijöihin maantiekuljetusyrityksen ympäristölähtöinen kilpailukyky perustuu. Tutkimuksessa keskitytään maantiekuljetusyrityksen tasolla tapahtuvaan toimintaan, joten yhteiskunnan tasolla toteutettavat toimenpiteet[2] maantiekuljetusten ympäristölähtöisyyden kehittämiseksi on jätetty tarkastelun ulkopuolelle.

2.2 Maantiekuljetusten ympäristövaikutukset

Kuljetusten tavoitteena on yhdistää logistisen toimitusketjun toimintoja, kuten ostotoiminta, tuotanto, varastointi ja jakelu, keskenään taloudellisesti ja laadukkaasti (Coyle – Bardi 1980, 198–199). Yritysten, tuotantolaitosten, varastojen ja markkinoiden maantieteellinen sijainti vaikuttaa kuljetusten asemaan yritysten toimitusketjuissa (Coyle et al 1990, 370–372). Koska yritykset ovat hajautuneet maantieteellisesti erilleen markkinoista ja alihankkijoista, kuljetuksia tarvitaan ylittämään tuotannon ja kulutuksen välimatkoja.

Suomen suuri pinta-ala, maantieteellisesti laajalle levinnyt asutus sekä teollisuuden rakenne ja hajautunut sijainti edellyttävät suuria kuljetussuoritteita (Mäntylä et al 2001, 123; SKAL 2002b). Lisäksi taloudellinen kehitys on kasvattanut työnjakoa toimitusketjun eri osien välillä ja muun muassa vähentänyt varastointia, mikä on puolestaan lisännyt kuljetusten kysyntää (Suomen liikenne kestävän kehityksen tielle 1993, 11). Suomessa tavaraliikenteen pääasialliset kuljetusmuodot ovat maantie-, rautatie- ja laivakuljetukset. Kuljetusmuodoista maantiekuljetusten kuljetussuorite on ollut suurin vuodesta 1958 lähtien. Maantiekuljetuksilla on Suomessa kansantaloudellisesti suuri merkitys, ja niiden kuljetussuorite asukasta kohden on 1,5–4-kertainen muihin EU-maihin verrattuna (SKAL 2002b).

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[2] Maantiekuljetusten ympäristövaikutukset ovat olleet esimerkiksi Euroopan unionin alueella poliittisen päätöksenteon kohteena. Varsinaisiksi toimenpiteiksi EU:n liikennepolitiikan valkoisessa kirjassa vuodelle 2010 on nimetty ympäristölähtöisempien polttoaineiden ja ajoneuvojen kehittäminen, nopeusrajoitukset ja moottorien energiatehokkuuden parantaminen. Samassa yhteydessä painotetaan myös maantiekuljetusten kehittämistä ympäristölähtöisemmäksi. Tähän pyritään muun muassa vähentämällä maanteitse tapahtuvia kuljetuksia, ruuhkautumista ja maantiekuljetusten muita ympäristövaikutuksia. (European Commission 2001c, 16–21, 115.)

Kuljetusten osuus logistiikan ympäristövaikutuksista on suuri ilman onnettomuuksiakin (O´Laughlin et al. 1993, 105–107; Wu – Dunn 1995, 32). Kuljetusten osuus tuotteen elinkaaren[3] haitallisista ympäristövaikutuksista voi olla yli puolet (Mäntylä et al 2001, 124). Maantiekuljetusten osuus näistä on suuri. Teollisuusvaltioissa kuljetusten osuus energiakulutuksesta on noin kolmannes, josta noin 80 % aiheutuu maantiekuljetuksista (Crosbie – Knight 1995, 189). Suomessa kuljetusten osuus kokonaisenergiankulutuksesta oli vuonna 2002 runsas 20 % (Mäkelä et al 2003, 47; SVT 2003, 6). EU:n jäsenmaissa vastaava osuus on ollut keskimäärin 31 % (European Commission 2001a, 72). Suomessa kuljetusten osuus kokonaisenergiankulutuksesta on selvästi EU-maiden keskimääräistä osuutta pienempi, mitä selittää teollisuuden suuri osuus maamme kokonaisenergiankulutuksesta.

Fossiilisten polttoaineiden, kuten bensiinin, dieselpolttonesteen tai polttoöljyn, käyttö aiheuttaa päästöjä. Ilmakehään kulkeutuvat päästöt lisäävät muun muassa kasvihuoneilmiötä ja sen aiheuttamaa ilmaston lämpenemistä sekä hengityselinsairauksien riskiä (Kalenoja – Kallberg 1998, 52–59, EEA 2000, 59). Kansainvälisesti liikenteen ennustetaan olevan suurin kasvihuonekaasujen päästölähde vuoteen 2010 mennessä (EEA 2000, 25). Suomessa esimerkiksi liikenteen hiilidioksidipäästöjen osuus kaikista kasvihuonekaasupäästöistä oli vuonna 2002 vajaa 18 % (Kalenoja et al 2002, 17). Tieliikenteen osuus näistä hiilidioksidipäästöistä oli suuri, 90 %, ja runsas 40 % niistä on peräisin tavaraliikenteestä (Motiva 2002a; Mäkelä et al 2003, 45).

Ilmatilaan kulkeutuvien päästöjen ohella kuljetukset aiheuttavat melua. Melun aiheuttamat haitat ja luonne riippuvat melutasosta, melun taajuudesta ja melun säännöllisyydestä. Yksilötasolla melun on todettu vaikuttavan ihmisen fyysiseen ja psyykkiseen hyvinvointiin jo melko matalilla tasoilla. Melu vaikuttaa ihmisten käyttäytymiseen, kuten asuinpaikan valintaan, ulkoilutottumuksiin ja keskittymiskykyyn. Eräs olennainen melun haittavaikutus on myös kiinteistöjen arvon lasku. (Kalenoja – Kallberg 1998, 81.)

Tieliikenteen melun määrä riippuu muun muassa liikennemäärästä, ajoneuvotyypeistä, ajonopeudesta ja tiepäällysteestä. Raskaiden ajoneuvojen melutaso on selvästi korkeampi kuin kevyemmillä ajoneuvoilla. Tieliikennemelulle on tyypillistä, että yksittäisen ajoneuvon melu ei erotu kokonaismelusta liikennevirran ollessa riittävän tiheä, mutta liikennemäärän kasvu lisää melun intensiteettiä. (Kalenoja – Kallberg 1998, 74–77.) Tieliikenteen melu on erityisesti tiheään asuttujen alueiden ongelma (Whitelegg 1993, 73–75), ja siihen on pyritty vaikuttamaan yhteiskunnallisesti vähentämällä muun muassa liikenteen ruuhkautumista.

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[3] Tuotteen elinkaari alkaa raaka-aineiden ottamisesta luonnosta ja päättyy päästöjen palautuessa luontoon kierrätys- ja uudelleenkäyttöjärjestelmien kautta (ks. esim. Cairncross 1991; Linnanen et al 1997).

Päästöjen ja melun ohella tieliikenne kuormittaa rakennusten ja teiden rakenteita. Staattisen kuormituksen lisäksi ajoneuvon liikkeistä ja teiden epätasaisuudesta aiheutuu tärinää. Erityisesti raskaat ajoneuvot synnyttävät tärinää, joka saattaa aiheuttaa maaperän painumista. Maaperän painuminen voi johtaa painuma-alueen rakenteiden kallistumiin ja vääristymiin, joista aiheutuu uusia rakennevaurioita esimerkiksi tierakenteisiin ja talojen perustuksiin (Kalenoja – Kallberg 1998, 90).

Kuljetusten ympäristölähtöisyyden kehittämisen kannalta on haasteellista, että maantiekuljetuksille vaihtoehtoiset kuljetusmuodot aiheuttavat myös haitallisia ympäristövaikutuksia (Engelhardt 1997, 187; Kalenoja – Kallberg 1998, 39; Suutari 1999, 14, 50; European Commission 2001b, 27). Lisäksi esimerkiksi rautatie- ja vesitse tehtävien kuljetusten alhainen joustavuus ja maantieteellisesti rajoittunut ulottuvuus vähentävät näiden kuljetusmuotojen kilpailukykyä (Penman 1994, 171; Bagchi – Skjött-Larsen 1995, 18). Lentoliikenne on puolestaan päästöiltään muita haitallisempi kuljetusmuoto sekä taloudellisesti tarkasteltuna kallis kuljetusvaihtoehto (Kalenoja – Kallberg 1998, 42; European Commission 2001b, 39–40).

Kuljetusten haitalliset ympäristövaikutukset eivät kuitenkaan ole usein ratkaisevassa asemassa kuljetuksista päätettäessä, vaan taloudelliset ja ajalliset kriteerit ohjaavat valintoja eri kuljetusmuotojen kesken (Crosbie – Knight 1995, 190; Kalenoja et al 2002, 63). Sopivimman kuljetusmuodon valinta riippuu liikennemahdollisuuksien ja kuljetusten kysynnän lisäksi paikallisista olosuhteista sekä käytettävissä olevasta infrastruktuurista (Kalenoja – Kallberg 1998, 11). Esimerkiksi suurin osa maamme ulkomaankuljetuksista tapahtuu laivaliikenteessä (Kalenoja et al 2002, 61), kun taas kotimaankuljetuksista suurin osa on tiekuljetuksia (SKAL 2002a).

Kuljetusmuotojen välisessä vertailussa maantiekuljetusten asema joustavana ja taloudellisesti kilpailukykyisenä kuljetusvaihtona on ylivertainen (Skjött-Larsen 2000, 385). Maantiekuljetusten tarpeellisuuden hyväksyminen maantieteellisten ja taloudellisten tekijöiden perusteella ei kuitenkaan edistä maantiekuljetusten ympäristövaikutusten vähentämistä, koska tällöin sallitaan maantiekuljetusten määrän kasvu ja maantieteellinen laajeneminen (Whitelegg 1993, 22, 35, 49). Kärjistetysti maantiekuljetusten ympäristölähtöisyys on paradoksaalista, koska tuotteiden fyysinen siirto yritysten, tuotantolaitosten ja kulutuksen välillä ei voi tapahtua ilman kuljetusten haitallisia ympäristövaikutuksia. Näin ollen maantiekuljetusten määrän kasvu lisää maantiekuljetusten ympäristölähtöisyyden kehittämisen tarvetta.

2.3 Maantiekuljetusyritysten ympäristövaikutusten vähentäminen

Ympäristölähtöinen kuljetuskalusto on maantiekuljetusten ja maantiekuljetusyrityksen ympäristölähtöisyyden tärkein lähtökohta (Short 1995, 10). Ympäristölähtöisellä kuljetuskalustolla tarkoitetaan vähäpäästöistä ja polttoainekulutukseltaan kehittynyttä kuljetuskalustoa, joka täyttää EU:n asettamat EURO-päästörajakriteerit[4].

Pohjolan (1999) mukaan olennainen keino kuljetusten ympäristövaikutusten vähentämiseksi on polttoainekulutuksen hallinta. Teknisesti polttoaineen kulutus riippuu ajoneuvon energiatarpeesta, joka riippuu ajovastusten[5] summasta. Ajovastuksista esimerkiksi ilmanvastusta voidaan vähentää parantamalla kuljetuskaluston aerodynaamisuutta (McKinnon et al 1993, 6). Ajovastusten ohella polttoaineen kulutukseen vaikuttavat ajoneuvon kokonaispaino, ajoneuvon moottoriteho, tieolosuhteet, liikenteen määrä, ajotapa ja ajonopeus (Haapanen – Oksanen 1986; 154, SKAL 2000, 5). Polttoainekulutuksen hallinta on tärkeää myös taloudellisista syistä (Szymankiewicz 1993, 40). Palkkojen ohella polttoainekustannukset muodostavat suuren osan maantiekuljetusyrityksen kustannuksista (European Commission 2001b, 90): mitä vähemmän polttoainetta kuluu, sitä pienemmät ovat polttoainekustannukset. Kustannusten hallinnan ohella tehokas ja taloudellinen kuljetus on havaittu myös ympäristölähtöiseksi (Mäntylä et al 2001, 124).

Ympäristölähtöinen kuljetuskalusto ei kuitenkaan yksistään takaa maantiekuljetusyrityksen toiminnan ympäristölähtöisyyttä, vaan se on riippuvainen myös kaluston käytön ja yrityksen muun toiminnan ympäristölähtöisyydestä (Crosbie – Knight 1995, 190; Suutari 1999, 48). Maantiekuljetusyrityksen toiminnan ympäristölähtöisyyden kehittämisen keinot voidaan jakaa kuljetuskapasiteetin hyödyntämiseen, kuljetusten suunnitteluun ja kaluston huoltoon liittyviin keinoihin sekä muihin ympäristölähtöisiin toimintatapoihin. Näillä kyetään vähentämään polttoainekulutusta ja pakokaasupäästöjä sekä muita ympäristövaikutuksia, kuten melua. (Janhunen 1997, 190.)

Kuljetuskapasiteetin hyödyntämisen tehostamiseen vaikuttavat kuljetuskapasiteetin maksimikoko, kuljetettavan rahdin koko, muoto ja paino sekä tyhjänä ajettavien kilometrien määrä (McKinnon 1999, 8–13). Kuljetuskapasiteetin käytön tehostamisella voidaan vähentää kuljetusten kokonaismäärää, polttoainekulutusta ja haitallisia ympäristövaikutuksia (Penman 1994, 165). Kuljetuskapasiteetin hyödyntämistä voidaan parantaa myös muun muassa

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[4] Ensimmäinen EURO I-päästöraja astui voimaan vuonna 1993, EURO II vuonna 1996 ja EURO III vuonna 2000. EURO IV on suunniteltu otettavan käyttöön vuonna 2005 ja viimeisimmät EURO V-päästörajat astuvat voimaan vuonna 2008. (European Commission 2001b, 79.) Suomessa päästörajat otettiin mukaan lainsäädäntöön vuonna 2000.

[5] Ajovastuksia ovat muun muassa vierintävastus ja ilmanvastus, joiden pienentäminen auttaa päästöjen, energiankulutuksen ja melun vähentämisessä (Kalenoja – Kallberg 1998, 183).

kuljetusten reittisuunnittelulla, jolla tarkoitetaan kuljetusten sekä mahdollisten paluukuormien aikataulu- ja reittisuunnittelua. Esimerkiksi jakelu- ja keräilytyyppisessä ajossa polttoainekulutus on pysähdysten lukumäärästä riippuen 1,2–1,3-kertainen keskeytymättömään maantieajoon verrattuna (Haapanen – Oksanen 1986, 158). Samoin nykivässä taajama-ajossa pakokaasupäästöt ovat suuremmat kuin tasaisessa maantieajossa, ja lisäksi tyhjäkäynti pitkään seisovissa ruuhkissa aiheuttaa enemmän päästöjä kuin ajettaessa (Kalenoja – Kallberg 1998, 147; Min 2002, 6). Optimaalisimmillaan kuljetukset ovat silloin, kun käytetään mahdollisimman harvoja lähetyksiä, vähäistä materiaalienkäsittelyä ja varastojen tehokasta organisointia sekä suoria jakelureittejä. Nämä vähentävät ylimääräisten kustannusten lisäksi myös kuljetusten haitallisia ympäristövaikutuksia (McKinnon 1999, 5–6; Murphy – Poist 2000, 6).

Optimaalisten reittien suunnittelu vaatii monentasoisen informaation analysointia, jota informaatioteknologian kehittyminen on edistänyt paljon (Cooper et al 1992, 299; McKinnon 1999, 7). Reittisuunnittelua avustavia välineitä ovat muun muassa kuljettajan yhteydenpitojärjestelmät, ajoneuvonavigointi ja dynaaminen reitinohjaus[6] (Kalenoja et al 2002, 60–61), joilla voidaan vähentää ylimääräisiä kuljetuksia ja turhia ajoja sekä välttää ruuhkautumista (McKinnon 1999, 10–11). Reittisuunnittelu on kuitenkin sidoksissa maantiekuljetusyrityksen asiakkaan tarpeisiin (McKinnon 1999, 13), joten kuljetusyrityksen tai ympäristön kannalta optimaalisinta reittivaihtoehtoa ei ole käytännössä kuitenkaan aina mahdollista saavuttaa, jos reittisuunnittelua ohjaavat esimerkiksi asiakkaan aikataululliset kriteerit.

Kuljetuksille asetetut vaatimukset lyhyistä kuljetusajoista ja pienistä kuljetuseristä edellyttävät usein nopeita kuljetuksia. Nämä eivät kuitenkaan tue ympäristölähtöisiä pyrkimyksiä optimaalista suuremman polttoainekulutuksen ja kuljetusten määrän kasvun vuoksi (Rao et al 1991, 105; Kalenoja – Kallberg 1998, 154). Lisäksi pienten kuljetuserien kuljettaminen vajaalasteina isolla kuljetuskalustolla on ympäristölähtöisesti ja taloudellisesti epäedullista (Janhunen 1997, 189–190). Kuljetusten yhdistelyllä ja jakeluyhteistyöllä voidaan vähentää ylimääräisiä ajokilometrejä ja polttoainekulutusta sekä tehostaa kuljetuskapasiteetin käyttöä. Eräs esimerkki kuljetusten yhdistelystä ja jakeluyhteistyöstä on kaupunkilogistiikka, jolla pyritään vähentämään pienten kuljetuserien aiheuttamaa kuljetusmäärien kasvua (Punakivi – Mäkinen 1997, 11–13). Kuljetusten yhdistelyn tai jakeluyhteistyön onnistuminen riippuu käytettävissä olevan liikennejärjestelmän ja sen käyttäjien ominaisuuksista, kuten kuljetuskalustosta, yhdistelyterminaaleista, varastointijärjestelmistä sekä kommunikaatio- ja ohjausjärjestelmistä (Punakivi – Mäkinen 1997, 20).

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[6] Dynaamisessa reitinohjauksessa kuljettajalle annetaan tietoa lyhimmistä reiteistä tai ruuhkista (Kalenoja et al 2002, 61).

Maantiekuljetusyrityksen ympäristölähtöisyys edellyttää, että tyhjillään kulkevaa kuljetuskalustoa on liikkeellä mahdollisimman vähän (Wu – Dunn 1995, 32–33). Esimerkiksi paluukuormien hyödyntäminen on ympäristön kannalta perusteltua, koska kuljetuskaluston siirto kuluttaa energiaa ja polttoainetta riippumatta kapasiteetin täyttöasteesta. Tyhjillään ajava kuorma-auto kuluttaa noin 60–80 % täyden auton energiankulutuksesta (Linnanen et al 1997, 119).[7] Ympäristövaikutusten vähentämisen lisäksi kuljetuskaluston pääomakustannukset ja toiminnan kannattavuus edellyttävät kaluston tehokasta käyttöä ja korkeaa täyttöastetta (Haapanen – Oksanen 1986, 30–31). Tyhjät paluu- tai siirtoajot aiheuttavat ylimääräisiä polttoaine-, henkilöstö- ja pääomakustannuksia sekä menetettyjä tuloja (Min 2002, 6). Tyhjänä ajon vähentämisen haasteena on se, että kuljetuskalustolle ei ole aina sopivaa kuormaa tarjolla. Toisin sanoen osa ajoneuvojen siirroista tapahtuu aina tyhjänä (Oksanen 2003, 61–62).

Kuljetuskaluston ominaisuuksien ja sen käytön ohjaamisen lisäksi kuljettajat ovat tärkeässä roolissa maantiekuljetusyrityksen energiankulutuksen ja päästöjen hallinnassa (Short 1995, 8; Crosbie – Knight 1995, 190, Kalenoja et al 2002, 63). Kuljettajien taloudellinen ajokäyttäytyminen vaikuttaa suoraan polttoainekulutukseen, ja se on nopeasti kehitettävissä oleva keino myös ympäristövaikutusten vähentämiseen (Wu – Dunn 1995, 33). Selvitysten mukaan epätaloudellinen ajokäyttäytyminen voi lisätä polttoainekulutusta 8–12 % (Motiva 2002b). Ympäristölähtöinen ajotapa edellyttää ajoneuvon tuntemusta, joutokäynnin välttämistä ja liikennetilanteita ennakoivaa ajotapaa (McKinnon et al 1993, 8). Ajokäyttäytymiseen ja kustannusten hallintaan liittyen myös polttoainekulutuksen seurannalla voidaan havaita kuljettajien epätaloudellisia ajotapoja ja mahdollisia kuljetuskaluston kulutusta lisääviä vikoja. Pohjolan (1999) teoreettiseen malliin viitaten polttoainekulutuksen seuranta on myös tärkeä osa maantiekuljetusyrityksen energiaa säästävää ja ympäristölähtöistä toimintaa.

Kuljetuskaluston ja moottorin ikä vaikuttavat päästöjen määrään, joten kaluston huoltaminen ja pitäminen hyväkuntoisena ovat tärkeitä keinoja maantiekuljetusyrityksen ympäristövaikutusten hallinnassa (Szymankiewicz 1993, 40, Short 1995, 10). Kaluston huollolla ylläpidetään kaluston kuntoa, turvallisuutta ja käyttöä sekä hallitaan paremmin myös kuljetuskaluston käytöstä syntyviä päästöjä (Wu – Dunn 1995, 33). Huoltoprosessissa syntyy kuitenkin myös haitallisia ympäristövaikutuksia, kuten jäteöljyjä, käytettyjä varaosia ja renkaita, joiden hallintaan on kiinnitettävä huomiota (Crosbie – Knight 1995, 193; Kalenoja – Kallberg 1998, 107). Kaluston huollon ohella myös

[7] Esimerkiksi Hämeen alueella tehdyssä selvityksessä runsaassa 30:ssa ulkomaankuljetuksia suorittavassa maantiekuljetusyrityksessä noin viidesosassa kaikista ajoista oli tyhjäajoa ja hieman vajaa viidesosa oli vajaakuormallista ajoa (Ojala 2000, 61). Isossa-Britanniassa tyhjänä ajettavien kilometrien määrä on keskimäärin 30 % kaikista ajoista (McKinnon 1999, 10).

renkaiden käyttöön ja kuntoon liittyvät toimenpiteet, kuten renkaiden pinnoitus, uusiminen riittävän usein tai ilmanpaineiden tarkistaminen, edistävät kuljetusten ympäristölähtöisyyttä ja vähentävät polttoainekulutusta (McKinnon et al 1993, 5; Short 1995, 5).

Maantiekuljetusyrityksen ympäristölähtöisyyden kehittämisessä hyödynnettävät toimenpiteet on koottu taulukkoon 1. Taulukossa esitetyt ympäristölähtöisyyden keinoja hyödynnetään maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn mallin tarkentamisessa.

Taulukko 1. Maantiekuljetusyrityksen ympäristölähtöisyyden kehittämisen keinot.

Ympäristölähtöisyyden keino	Lähde
Ympäristölähtöinen kuljetuskalusto	Short 1995, Suutari 1999, Pohjola 1999
Kuljetuskapasiteetin tehokas hyödyntäminen	Penman 1994, Black – Peters 1997, McKinnon 1999
Kuljetusten reittisuunnittelu	Wu – Dunn 1995, McKinnon 1999
Kuljetuksia tukevan teknologian hyödyntäminen	Cooper et al 1992, McKinnon 1999, Kalenoja et al 2002
Tyhjänä ajon vähentäminen	Wu – Dunn 1995, McKinnon 1999, Oksanen 2003
Kuljetusten yhdistely/ jakeluyhteistyö	Rao et al 1991, Kalenoja – Kallberg 1998
Kuljettajien ympäristölähtöinen ajokäyttäytyminen	McKinnon et al 1993, Wu – Dunn 1995, Short 1995, Kalenoja et al 2002
Kaluston huolto	Szymankiewicz 1993, McKinnon et al 1993, Short 1995, Wu – Dunn 1995, Kalenoja – Kallberg 1998

Jotta maantiekuljetusyritykset lisäisivät toimintansa ympäristölähtöisyyttä, sen tulisi tuottaa yritykselle lisäarvoa ja kilpailukykyä muihin alan yrityksiin verrattuna. Maantiekuljetusyritykset kokevat ympäristölähtöisyyden melko tärkeäksi tekijäksi kilpailukykynsä kannalta. Lisäksi maantiekuljetusyrityksissä vaikuttaa sekä sisäisiä (mm. yrityksen johdon kiinnostus) että ulkoisia (mm. yrityksen asiakkaat, lainsäädäntö) motivaatiotekijöitä, jotka lisäävät yritysten mielenkiintoa ympäristölähtöisyyteen. (Stenholm 2004.) Yhdessä nämä tekijät luovat potentiaalisen lähtökohdan maantiekuljetusyritysten ja laajemmassa tarkastelussa maantiekuljetusten ympäristölähtöisyyden kehittämiselle. Siten maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn mallin lähemmällä tarkastelulla voidaan lisätä maantiekuljetusyritysten ja -yrittäjien tietoisuutta, ymmärrystä ja motivaatiota ympäristölähtöisyytensä kehittämiseen.

2.4 Maantiekuljetusyritysten ympäristölähtöisen kilpailukyvyn malli

2.4.1 Resurssiperusteinen näkemys yrityksen kilpailukyvystä

Maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn tarkastelun pohjana käytetään resurssiperusteista näkemystä yrityksen kilpailukyvystä. Resurssiperusteinen näkemys perustuu oletukseen, jonka mukaan yrityksen resurssit ja niiden hyödyntäminen selittävät yrityksen kilpailukykyä paremmin kuin toimiala- tai kilpailuympäristötekijät (Barney 1986b, 1239; Olavarrieta – Ellinger 1997, 561). Resurssit luovat rajat yrityksen toiminnalle ja strategioille (Grant 1991, 133), ja ne ovat yhteydessä tuotteiden tai palvelujen ominaisuuksiin ja siten myös yrityksen kilpailukykyyn sekä yritysten välisiin eroihin kilpailukyvyssä (Conner 1991, 139). Resurssiperusteisella näkemyksellä pyritään selvittämään, miten yritykset saavuttavat ja ylläpitävät kilpailukykyään (Hoskisson et al 1999, 437). Resurssiperusteinen näkemys tarjoaa täsmällisen lähtökohdan tutkimusongelman ratkaisemiseen, koska näkemyksessä keskitytään tarkastelemaan yrityksen resurssien vaikutusta yrityksen kilpailukykyyn (Winter 1996, 174). Yrityksen kilpailukyvyllä tarkoitetaan tässä tutkimuksessa yrityksen resurssien ja niitä jalostavien prosessien muodostamaa kokonaisuutta, jolla yritys asemoituu markkinoilla muihin yrityksiin nähden.

Resurssiperusteisessa näkemyksessä yrityksen resursseilla tarkoitetaan tekijöitä, joita voidaan pitää yrityksen vahvuuksina. Yrityksen resurssit voivat olla aineellisia tai aineettomia (Penrose 1959, 24; Itami – Roehl 1987, 12). Ne voivat olla kehittyneet yrityksen toiminnassa (Dierickx – Cool 1989, 1505) tai niitä on voitu hankkia erikseen markkinoilta (Barney 1986b, 1232). Resurssit voidaan jakaa kolmeen luokkaan: fyysisiin resursseihin ja osaamisresursseihin sekä organisatorisiin toimintatapoihin. Resurssiperusteisen näkemyksen taustaoletuksiin lukeutuu myös erilaiset vaatimukset yrityksen kilpailukykyä luoville resursseille (Fahy 2000, 96–98). Resurssien tulee olla arvokkaita, niukkoja ja vaikeasti jäljiteltäviä (Barney 1991, 105–106; Grant 1991, 129; Amit – Schoemaker 1993, 39).

Resurssien arvokkuus merkitsee sitä, että resursseilla voidaan toteuttaa strategioita, joilla kyetään hyödyntämään markkinoilla olevia mahdollisuuksia tai ehkäisemään kilpailijoiden toimenpiteiden vaikutusta yrityksen kilpailukykyyn (Barney 1991, 106; Collis – Montgomery 1995, 120). Resurssien niukkuus syntyy siitä, että yrityksen kilpailukykyä luovia resursseja ei voida hyödyntää suoraan muiden yritysten toiminnassa (Barney 1991, 106). Tällaisia resursseja voivat olla muun muassa tuotanto- ja palveluprosessit sekä henkilöstön osaaminen. Resursseja voidaan pitää niukkoina myös, jos ne ovat maantieteellisesti sidottuja, kuten raaka-aineet, tai jos kilpailijoilla ei ole riittävästi tietoa niiden hyödyntämisestä. (Grant 1991, 126.)

Resurssien vaikea jäljiteltävyys tarkoittaa, että yrityksen kilpailijoiden ei ole mahdollista kopioida tai imitoida yrityksen kilpailukykyä luovaa resurssia omassa toiminnassaan. Resurssien vaikea jäljiteltävyys perustuu yrityksessä olevaan osaamiseen ja kokemuksiin, resurssien kehitysprosesseihin, resurssien sosiaaliseen moniulotteisuuteen tai resurssien ja yrityksen toiminnan välillä olevien kausaalisten yhteyksien epäselvyyteen. Tällaisia resursseja ovat esimerkiksi yrityksen imago ja yrityksessä kumuloitunut osaaminen (Hall 1993, 609; Coates – McDermott 2002, 448). Imitointia vaikeuttaa myös se, että tietyn yksittäisen kilpailukykyä luovan resurssin kopiointi ei välttämättä riitä, vaan samalla kilpailijoiden olisi usein kopioitava myös muita resurssiin sidoksissa olevia resursseja ja toimintatapoja (Prahalad – Hamel 1990, 82, 84).

Yrityksen arvokkaat, niukat ja vaikeasti jäljiteltävissä olevat resurssit eivät yksistään luo yritykselle kilpailukykyä. Kilpailukyky perustuu yrityksen omistamien resurssien lisäksi myös niiden käyttöön. Day (1994, 39–42) jakoi yrityksen resurssien käyttöön liittyvät tekijät yritykseen ulkopäin tuleviin, yrityksestä ulospäin suuntautuviin ja yrityksen yli ulottuviin prosesseihin. Nämä prosessit jalostavat fyysisiä resursseja ja osaamisresursseja sekä organisatorisia toimintatapoja yrityksen kilpailukyvyksi (Dierickx – Cool 1989, 1510; Grant 1991, 122–123; Amit – Schoemaker 1993, 35–36). Dayn esittämät prosessit ja resurssiperusteista näkemystä hallitseva yrityksen resurssien kolmijako (Wernerfelt 1984, 172; Barney 1991, 101; Olavarrieta – Ellinger 1997, 566–567) yhdistetään tässä tutkimuksessa yhdeksi malliksi. Dayn esityksessä keskitytään yritysten markkinaorientoitumiseen, joka ei sellaisenaan sovellu tämän tutkimuksen tutkimusongelman ratkaisuun. Tästä syystä Dayn esitystä prosesseista hyödynnetään mukailtuna seuraavaksi esitetyin perustein.

2.4.2 Maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn malli

Tutkimuksen käsitemallissa oletetaan, että luonnonympäristön huomioon ottaminen yrityksen toiminnassa edellyttää yritykseltä ympäristölähtöisiä resursseja ja niiden ympäristölähtöistä hyödyntämistä (vrt. Rodriguez et al 2002, 140). Ympäristölähtöinen kilpailukyky voidaan nähdä liiketaloudellisesti tarkasteltuna resurssitehokkuutena. Päästöt ja jätteet syntyvät resurssien tehottomasta käytöstä, ja mitä vähemmän yritys tuottaa päästöjä ja jätteitä, sitä tehokkaampaa on yrityksen resurssien käyttö (Porter – van der Linde 1995, 122). Päästöjen väheneminen ei kuitenkaan välttämättä ole yrityksen toiminnan ympäristölähtöisyyden kehittymisen tulos, koska niitä voidaan ehkäistä ilman varsinaista toiminnan kehittämistä (Cairncross 1991, 115, 233–234; Hart 1995, 992).

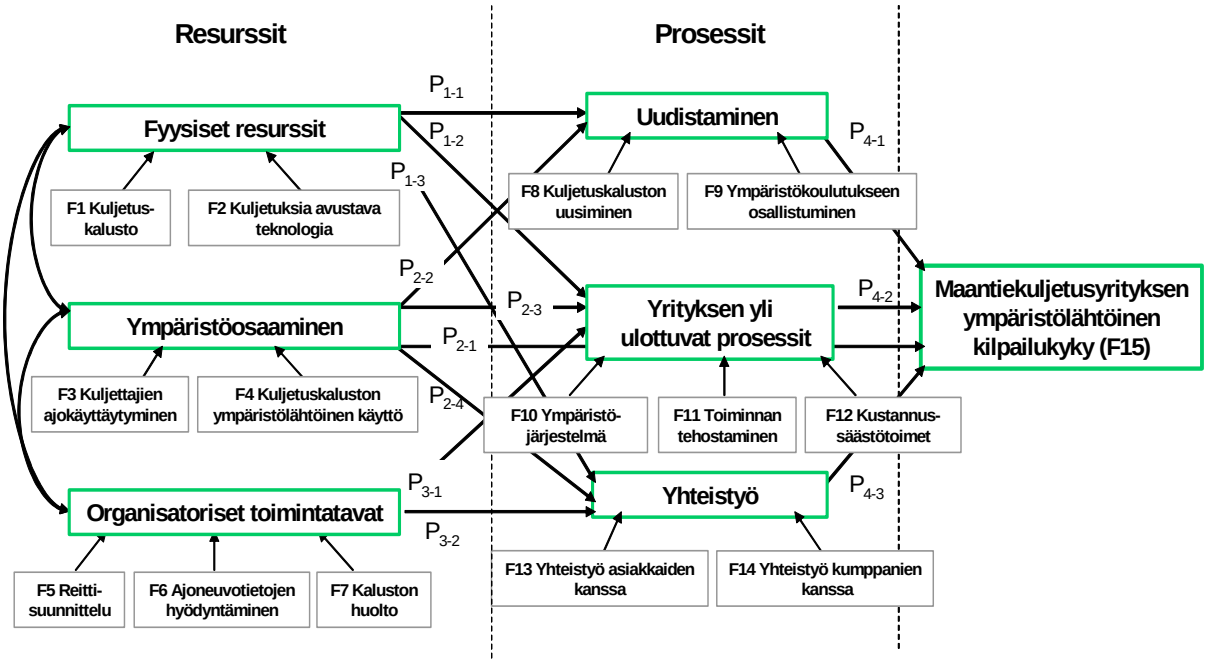
Tutkimuksessa oletetaan, että ympäristölähtöisyyden limittyessä osaksi yrityksen fyysisiä resursseja ja osaamisresursseja sekä organisatorisia toimintatapoja, ympäristölähtöisten resurssien erottaminen yrityksen kilpailukykytekijöistä vaikeutuu (Hart 1995, 999; Russo – Fouts 1997, 538). Näin ollen yritykselle syntyy yrityksen kilpailukyvylle olennaisia, rajallisesti saatavilla olevia ympäristölähtöisiä resursseja ja sitä, että yritys kykenee hyödyntämään niitä ympäristölähtöisesti (Bloemhof-Ruwaard et al 1995, 230; Porter – van der Linde 1995, 125; Buchholz 1998, 354). Tällöin resurssiperusteisen näkemyksen mukaiset vaatimukset resurssien arvokkuudesta, niukkuudesta ja vaikeasta jäljiteltävyydestä täyttyvät (Barney 1986a, 663; Russo – Fouts 1997, 551). Tämä tutkimus rajautuu yrityksen sisäisten resurssien ja prosessien vaikutusten analysointiin, eikä tutkimuksessa selvitetä yrityksen asiakkaiden tai muiden sidosryhmien näkemysten perusteella analysoitavaa yrityksen ympäristökilpailukykyä (vrt. Lovio – Kuisma 2004, 42).

Resurssiperusteisessa näkemyksessä yrityksen ympäristölähtöisen kilpailukyvyn lähtökohta on ympäristövaikutusten vähentäminen ympäristölähtöisillä fyysisillä resursseilla, ympäristöosaamisella, organisatorisilla toimintatavoilla ja niitä jalostavilla prosesseilla. Kuviossa 1 esitettyä mallia sovelletaan samalla maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn tutkimiseen. Seuraavaksi tarkastellaan lähemmin mallin osia ja niiden välisiä hypoteettisia vaikutussuhteita. Kuviossa esitetyt vaikutussuhteet kuvaavat seuraavaksi esitettäviä tutkimuksen olettamuksia ympäristölähtöisen kilpailukyvyn eri tekijöiden välisistä vaikutussuhteista. Kuviossa pienemmät laatikot mallin päämuuttujien alla kuvaavat maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn tarkennettuja tekijöitä. Nämä liittyvät mallin operationalisointiin, jota ei käsitellä tässä yhteydessä tarkemmin.[8]

Yrityksen resurssien ympäristölähtöisyys vaikuttaa siihen, miten ympäristölähtöisesti yritys kykenee toimimaan (Florida et al 2001, 222). Maantiekuljetusyrityksen ympäristölähtöisiä fyysisiä resursseja ovat ympäristölähtöisellä moottoriteknologialla varustettu kuljetuskalusto ja kuljetuksia avustava teknologia. Maantiekuljetusyrityksen kuljetuskalusto on yrityksen toiminnan ydin, ja sen ominaisuudet, kuten polttoainekulutus ja pakokaasupäästöt, vaikuttavat yrityksen toiminnan taloudellisuuteen ja ympäristölähtöisyyteen (Meyer – Malachowski 1997, 375–376; Kent et al 2001, 31). Yleinen teknologinen kehitys kuitenkin vähentää fyysisten resurssien haitallisia ympäristövaikutuksia, jolloin tällaisten resurssien ympäristölähtöisyys paranee yleisesti (Hanna – Newman 1995, 48; Bonifant et al 1995, 44–45). Maantiekuljetusalalla on tällainen tilanne, koska moottoriteknologian kehitystä ja käyttöönottoa ohjataan EU:n asettamilla säännöksillä. Kuljetuskaluston ohella myös kuljetuksia avustavalla teknologialla on vaikutusta maantiekuljetusyrityksen

[8] Mallin operationalisoinnista enemmän ks. Stenholm 2004, 62–64.

ympäristölähtöisyyteen. Esimerkiksi polttoainekulutuksen seurannalla tai reittisuunnitteluvälineillä voidaan vähentää ylimääräisiä kuljetuksia ja polttoainekulutusta. Myös tällaista teknologiaa on hankittavissa markkinoilta vapaasti, joten kaikilla maantiekuljetusyrityksillä on mahdollisuus hyödyntää sitä.



Kuvio 1. Maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn malli.

Resurssiperusteisen näkemyksen olettamusten perusteella maantiekuljetusyrityksen ympäristölähtöiset fyysiset resurssit eivät voi olla pelkästään ympäristölähtöisen kilpailukyvyn lähteenä. Ne eivät täytä vaatimuksia resurssien arvokkuudesta, niukkuudesta tai vaikeasta jäljiteltävyydestä, jos kaikilla alan yrityksillä on teoriassa samanlaiset mahdollisuudet hankkia samanlaisia ympäristölähtöisiä fyysisiä resursseja. Käytännössä kaikilla yrityksillä ei ole tasavertaisia taloudellisia mahdollisuuksia pitää kuljetuskalustoaan uusimpien säännösten edellyttämällä tasolla. Tällaisessa tilanteessa fyysisten resurssien käyttö ainoana ympäristölähtöisen kilpailukyvyn lähteenä ei ole myöskään taloudellisesti perusteltua. Tällöin voidaan olettaa, että ympäristölähtöisillä fyysisillä resursseilla ei ole suoraa vaikutusta ympäristölähtöiseen kilpailukykyyn. Tämän vaikutussuhteen sijasta tässä oletetaan, että ympäristölähtöiset fyysiset resurssit tukevat yrityksen muita ympäristölähtöisiä prosesseja, ja että fyysiset resurssit vaikuttavat ympäristölähtöiseen kilpailukykyyn epäsuorasti uudistamisen (P_{1-1}), yrityksen yli ulottuvien prosessien (P_{1-2}) ja yhteistyön (P_{1-3}) kautta. Uudistamisen kautta syntyvä vaikutus perustuu esimerkiksi ympäristölähtöisempien fyysisten resurssien hankintaan. Yrityksen yli ulottuvissa prosesseissa ympäristölähtöisten fyysisten resurssien vaikutus syntyy niiden käytön tehostamisesta ja yhteistyössä fyysisten resurssien hyödyntämisestä yhteistyökumppaneiden kanssa tai heidän vaatimallaan tavalla.

$P_{1\text{-}1,2,3}$: Ympäristölähtöisillä fyysisillä resursseilla on epäsuoraa vaikutusta yrityksen ympäristölähtöiseen kilpailukykyyn uudistamisen ($P_{1\text{-}1}$) ja yrityksen yli ulottuvien prosessien ($P_{1\text{-}2}$) ja yhteistyön ($P_{1\text{-}3}$) kautta.

Ympäristölähtöinen toiminta edellyttää ympäristölähtöisten resurssien lisäksi myös yrityksen ja henkilöstön ympäristöosaamista (Kleiner 1991, 40; Russo – Fouts 1997, 538–543). Tutkimuksen käsitemallissa resurssiperusteisen näkemyksen osaamisresurssit nimetäänkin ympäristöosaamiseksi. Maantiekuljetusyrityksissä tämä tarkoittaa henkilöstön ympäristöosaamista ja kuljetuspalvelun ympäristölähtöisyyttä. Henkilöstön ympäristöosaaminen tarkoittaa kuljettajien taloudellista ja ympäristölähtöistä ajokäyttäytymistä. Maantiekuljetusyrityksissä kuljettajien ajokäyttäytyminen ohjaa ympäristölähtöisen kuljetuspalvelun toteutumista ja samalla se on asiakkaille näkyvä osa yrityksen ympäristölähtöistä toimintaa. Kuljettajat ovat tärkeässä roolissa maantiekuljetusyrityksen ympäristölähtöisen imagon ja asiakkaiden suhtautumisen kannalta. Tällöin tässä tutkimuksessa oletetaan, että ympäristöosaamisella on suoraa vaikutusta yrityksen kilpailukykyyn ($P_{2\text{-}1}$). Kuljetuspalvelun ympäristölähtöisyys tarkoittaa puolestaan ympäristölähtöisyyden huomioon ottamista esimerkiksi kuljetusten reittisuunnittelussa tai kuljetuskapasiteetin hyödyntämisessä. Ympäristöosaaminen on myös yhteydessä fyysisten resurssien ympäristölähtöiseen hyödyntämiseen ja organisatorisiin toimintatapoihin.

Henkilöstön ympäristöosaaminen vaatii henkilöstön kouluttautumista (Linnanen et al 1997, 173–179; Björklund 2002, 112). Kotimaiset maantiekuljetusyritykset voivat osallistua näille suunnattuun ympäristö- ja laatukoulutukseen, jolloin usealla yrityksellä on mahdollisuus kehittää ympäristöosaamistaan. Ympäristökoulutuksen hyödyntäminen ja soveltaminen on kuitenkin yrityskohtaista, jolloin yritysten väliset erot ovat mahdollisia. Kouluttautuminen ja uuden oppiminen yhdistää ympäristöosaamisen yrityksessä tapahtuvaan uudistamiseen ($P_{2\text{-}2}$).

Yrityksen yli ulottuvat ympäristölähtöiset prosessit edellyttävät henkilöstön ympäristöosaamista, jolloin näiden välillä oletetaan olevan vaikutusta ($P_{2\text{-}3}$). Ympäristöosaamisen oletetaan olevan yhteydessä myös yhteistyöhön, jolloin henkilöstön ja yrityksen ympäristöosaaminen vaikuttaa yrityksen ympäristölähtöiseen yhteistyöhön asiakkaiden ja yhteistyökumppaneiden kanssa ($P_{2\text{-}4}$). Koska ympäristöosaamisella oletetaan olevan sekä suoraa että epäsuoraa vaikutusta ympäristölähtöiseen kilpailukykyyn, sillä on potentiaalia strategisesti tärkeäksi kilpailukykytekijäksi. Yrityksen kilpailijoiden on vaikea jäljitellä tällaista syy-seuraus-suhteeltaan epäselvää kilpailukykytekijää (Slater – Angel 2000, 86).

$P_{2\text{-}1,2,3,4}$: Ympäristöosaamisella on suoraa vaikutusta yrityksen ympäristölähtöiseen kilpailukykyyn ($P_{2\text{-}1}$) ja epäsuoraa vaikutusta yrityksen ympäristölähtöiseen kilpailukykyyn uudistamisen ($P_{2\text{-}2}$), yrityksen yli ulottuvien prosessien ($P_{2\text{-}3}$) ja yhteistyön ($P_{2\text{-}4}$) kautta.

Yrityksen ympäristölähtöiset organisatoriset toimintatavat puolestaan yhdistävät yrityksen ympäristöosaamista ja fyysisiä resursseja keskenään. Ympäristölähtöistä kilpailukykyä kehitettäessä yrityksessä on otettava huomioon resurssien käytön ympäristövaikutukset ja pyrittävä vähentämään niitä muuttamalla prosesseja tai optimoimalla resurssien käyttöä (Bloemhof-Ruwaard et al 1995, 232–233; Shrivastava 1995, 131). Yrityksen organisatoristen toimintatapojen ympäristölähtöisyyttä kehittämällä voidaan vähentää resurssien ylimääräistä käyttöä ja toiminnasta syntyvää jätettä sekä lisätä toiminnan tuottavuutta (van Hoek 1999, 130). Yrityksen ympäristölähtöiset organisatoriset toimintatavat liittyvät yrityksen muiden resurssien hallintaan ja käyttöön, ja ne tukevat ympäristölähtöisten fyysisten resurssien käyttöä ja ympäristöosaamista. Myös organisatoristen toimintatapojen kehittämisestä syntyvä oppiminen ja kokemukset voivat vaikeuttaa yrityksen ympäristölähtöisten toimintatapojen ja ympäristölähtöisen kilpailukyvyn lähteiden jäljiteltävyyttä (vrt. Dean – Brown 1995, 292; Hamel 2000, 75–77).

Maantiekuljetusyrityksen ympäristölähtöisillä organisatorisilla toimintatavoilla esimerkiksi ylläpidetään kuljetuskaluston kuntoa, suorituskykyä ja ympäristölähtöisiä ominaisuuksia. Näitä ovat kaluston huolto ja renkaiden kunnosta huolehtiminen. Myös toimintatavat, joilla vaikutetaan kuljetusten määrään, ovat ympäristölähtöisiä organisatorisia toimintatapoja. Tällaisia toimintatapoja ovat esimerkiksi kuljetusten reittisuunnittelu tai kuljetuksia avustavilla tekniikoilla kerättävien ajoneuvotietojen hyödyntäminen yrityksen toiminnassa. Organisatorisilla toimintatavoilla oletetaan olevan vaikutusta maantiekuljetusyrityksen yli ulottuviin prosesseihin ($P_{3\text{-}1}$) ja yhteistyöhön ($P_{3\text{-}2}$). Näitä oletetaan yhdistävän esimerkiksi yrityksen resurssien hallinnan ja toiminnan tehostamisen riippuvuus organisatorisista toimintatavoista sekä organisatorisilla toimintatavoilla yhteistyön pohjaksi tuotettava informaatio.

$P_{3\text{-}1,2}$: Organisatorisilla toimintatavoilla on epäsuoraa vaikutusta yrityksen ympäristölähtöiseen kilpailukykyyn yrityksen yli ulottuvien prosessien ($P_{3\text{-}1}$) ja yhteistyön ($P_{3\text{-}2}$) kautta.

Resurssiperusteisen näkemyksen mukaan yksittäinen resurssi on usein ainakin osittain riippuvainen muista yrityksen resursseista, jolloin sen vaikutusta kilpailukykyyn on vaikea erottaa toisista resursseista (Dierickx – Cool 1989, 1508; Foss et al 1996, 8). Tässä tutkimuksessa oletetaankin, että yrityksen

ympäristölähtöiset fyysiset resurssit ja ympäristöosaaminen sekä organisatoriset toimintatavat ovat yhteydessä toisiinsa, mutta niiden välisten vaikutussuhteiden suuntaa ei voida päätellä. Näitä yhteyksiä kuvataan käsitemallissa kahdensuuntaisilla nuolilla, jotka yhdistävät resurssit toisiinsa.

Näiden lisäksi yrityksen ympäristölähtöinen kilpailukyky edellyttää yrityksen resursseja jalostavien prosessien ympäristölähtöisyyttä. Yritykseen ulkoapäin tulevilla prosesseilla omaksutaan tai hankintaan uutta osaamista ja uusia toimintatapoja yrityksen toimintaan (Hooley et al 2001, 509). Tällaisia prosesseja ovat esimerkiksi markkinoilta oppiminen ja teknologian kehityksen seuraaminen (Day 1994, 41). Nämä prosessit perustuvat pitkälti yrityksen fyysisiin resursseihin ja osaamisresursseihin, ja ne kuvaavat näihin resursseihin liittyvää uudistamista (Lahti-Nuuttila 1998, 12). Tästä syystä nämä prosessit nimetään tässä tutkimuksessa uudistamiseksi Dayn esittämän yritykseen suuntautuvien prosessien sijaan. Ympäristölähtöisten toimintatapojen oppiminen ja yritykseen hankittavien ympäristölähtöisten resurssien eli uudistamisen vaikutus kilpailukykyyn perustuu yrityksen fyysisiin resursseihin ja ympäristöosaamiseen sekä organisatorisiin toimintatapoihin.

Uudistaminen tuo yrityksen toimintaan uutta osaamista ja vaatimuksia ympäristölähtöisten toimintatapojen omaksumiseen. Maantiekuljetusyrityksessä uudistaminen liittyy ensinnäkin moottoriteknologian kehittymiseen, joka vähentää maantiekuljetusyrityksen toiminnan haitallisia ympäristövaikutuksia. Käytännössä maantiekuljetusyrityksellä on vähäinen mahdollisuus vaikuttaa moottoriteknologian kehittymiseen. Tällöin teknologian kehittymisen mahdollistama kilpailukyky syntyy uuden teknologian hankkimisesta ja hyödyntämisestä (Slater – Angel 2000, 86; Björklund 2002, 67–68). Uudistaminen sisältää myös henkilöstön ympäristöosaamisen kehittämisen, sillä henkilöstön ympäristöosaaminen vaatii usein henkilöstön kouluttautumista, kuten ympäristöosaamisen kohdalla todettiin. Uudistamisen oletetaankin pohjautuvan maantiekuljetusyrityksen ympäristölähtöisiin fyysisiin resursseihin ja ympäristöosaamiseen, ja uudistaminen käsitetään prosessiksi, jolla olemassa olevien fyysisten resurssien ympäristölähtöisyyttä ja ympäristöosaamista parannetaan edelleen. Uudistamisella oletetaan olevan suoraa vaikutusta maantiekuljetusyrityksen ympäristölähtöiseen kilpailukykyyn ($P_{4\text{-}1}$).

Yrityksen yli ulottuvia prosesseja ovat muun muassa tuotekehitys, tilausten täyttäminen ja strategian kehittäminen, ja niiden vaikutus ulottuu koko yrityksen toimintaan (Day 1994, 41). Ympäristölähtöisen kilpailukyvyn kannalta keskeisiä yrityksen yli ulottuvia prosesseja ovat yrityksen ympäristölähtöisyyttä kehittävät prosessit, kuten toiminnan tehostaminen ja kustannussäästötoimenpiteet (vrt. Hart 1995, 993; Lahti-Nuuttila 1998, 129). Nämä prosessit nimetään tämän tutkimuksen mallissa Dayn esityksen mukaisesti. Yrityksen yli ulottuvilla ympäristölähtöisillä prosesseilla kehitetään yrityksen toimintaa

ympäristölähtöisemmäksi. Tämä tarkoittaa muun muassa energiankulutuksen vähentämistä tai koneiden ja laitteiden ympäristölähtöisempää käyttöä (Shrivastava 1995, 130; Porter – van der Linde 1995, 126). Maantiekuljetusyrityksessä näiden prosessien oletetaan ilmenevän myös toiminnan tehostamisena ja kustannussäästötoimenpiteinä sekä ympäristöjärjestelmänä, -politiikkana tai vastaavana dokumentoituna ilmaisuna. Ympäristöjärjestelmä on tärkeä osa yrityksen yli ulottuvia ympäristölähtöisiä prosesseja, ja sen vaikutus ulottuu koko yrityksen toimintaan (Jennings – Zandbergen 1995, 1020). Toiminnan tehostaminen edellyttää muun muassa kokonaisajosuoritteen, vajaakuormallisten ajojen tai tyhjänä ajettavien ajokilometrien vähentämistä tai kuljetuskaluston täyttöasteen tehostamista. Ympäristölähtöisten prosessien ohella kustannussäästöihin pyrkivät toimenpiteet, kuten polttoainekulutuksen vähentäminen, ohjaavat maantiekuljetusyrityksen toimintaa ympäristölähtöisemmäksi. Yrityksen yli ulottuvien prosessien oletetaan vaikuttavan suoraan yrityksen ympäristölähtöiseen kilpailukykyyn ($P_{4\text{-}2}$).

Dayn (1994, 41–42) mukaan resurssien hyödyntämiseen liittyvät myös yrityksestä ulospäin suuntautuvat prosessit. Tällaisia prosesseja ovat Dayn mukaan muun muassa kustannusten hallinta, teknologian kehittäminen, tuotanto-osaaminen tai inhimillisten resurssien johtaminen. Näitä ohjaavat asiakkaiden vaatimukset, kilpailuhaasteet ja muut yrityksen ulkopuoliset mahdollisuudet (Hooley et al 2001, 509). Asiakkaiden voimakkaan vaikutuksen johdosta (Prahalad – Hamel 1990, 84; Murphy et al 1995, 12; Mäntylä et al 2001, 33–34) tällaiset prosessit nimetään tässä tutkimuksessa yhteistyöksi Dayn esittämän yrityksestä suuntautuvien prosessien sijaan. Tässä yhteistyöllä tarkoitetaan asiakkaiden ja yhteistyökumppaneiden kanssa tapahtuvan ympäristölähtöisyyteen liittyvän yhteistyön vaikutusta yrityksen kilpailukykyyn. Asiakkaat rajataan tässä yritysasiakkaisiin. Ympäristölähtöiseen yhteistyöhön vaikuttavat yrityksen ympäristöosaaminen ja yrityksen fyysiset resurssit, jotka ovat myös osa yrityksestä ulospäin näkyvää ympäristölähtöisyyttä. Näiden lisäksi myös organisatorisilla toimintatavoilla on vaikutusta yhteistyöhön asiakkaiden kanssa. Maantiekuljetusyrityksessä yhteistyö tiivistyy yhteistyökumppanien ja asiakkaiden ympäristölähtöisyyden hyödyntämiseen ja/tai niiden asettamiin vaatimuksiin (vrt. Bowen et al 2001, 177; Björklund 2002, 136–137). Asiakas on todettu olennaisimmaksi ympäristöasioihin vaikuttavaksi tekijäksi (Björklund 2002, 52–65), joten maantiekuljetusyrityksen ympäristölähtöisyys on sidoksissa asiakkaiden vaatimuksiin (vrt. Cooper et al 1992, 271; Linnanen et al 1997, 108).

Asiakkaiden ja yhteistyökumppanien kanssa tapahtuva ympäristölähtöinen toiminta edellyttää informaation jakamista ja tiivistä yhteistyötä eri osapuolien välillä (Greenan et al 1997, 213; Rodriguez et al 2002, 142). Toimivat yhteistyösuhteet muodostavat yritykselle kilpailukykytekijän, jota toisten yritysten

on vaikea kopioida. Samalla yrityksestä ulospäin suuntautuvat prosessit vaikuttavat myös yrityksen ympäristölähtöiseen maineeseen. (Hart 1995, 996, 1001.) Tällainen suhde ohjaa yritystä lähemmäs markkinoiden vaatimuksia (Goldsby – Stank 2000, 199). Asiakkaiden vaatimukset yrityksen ympäristölähtöisyydelle liittyvät asiakkaiden omien ympäristölähtöisten tavoitteiden edellyttämään toimintaan (Bonifant et al 1995, 37). Asiakkaiden käytössä oleva ympäristöjärjestelmä on esimerkki ympäristölähtöisyyttä ohjaavasta johtamisvälineestä, joka edellyttää ympäristölähtöisyyttä myös näiden yrityksen kanssa toimivilta yrityksiltä (Linnanen et al 1997, 108). Yhteistyöhön liittyvät ympäristölähtöiset prosessit voivat tarkoittaa myös yhteistyötä muiden kuljetusyritysten kanssa, jolloin esimerkiksi paluukuljetusten yhdistäminen voi olla eräs kilpailukykyä lisäävä tekijä kilpailluilla kuljetusmarkkinoilla (Bagchi – Skjött-Larsen 1995, 15–16). Tässä tutkimuksessa oletetaan, että yhteistyö vaikuttaa muun muassa yrityksen maineeseen ja siten suoraan ympäristölähtöiseen kilpailukykyyn ($P_{4\text{-}3}$).

$P_{4\text{-}1,2,3}$: Yrityksen resursseja jalostavat prosessit, uudistaminen ($P_{4\text{-}1}$), yrityksen yli ulottuvat prosessit ($P_{4\text{-}2}$) ja yhteistyö ($P_{4\text{-}3}$), vaikuttavat suoraan yrityksen ympäristölähtöiseen kilpailukykyyn.

Resurssiperusteinen näkemys maantiekuljetusyrityksen ympäristölähtöisestä kilpailukyvystä tarkoittaa kokonaisuutta, jossa ympäristölähtöisiä fyysisiä resursseja, ympäristöosaamista ja organisatorisia toimintatapoja hyödynnytetään uudistamisella, yrityksen yli ulottuvilla ympäristölähtöisillä prosesseilla ja yhteistyöllä ympäristölähtöisen kilpailukyvyn saavuttamiseksi. On kuitenkin otettava huomioon, että resurssien ja niiden hyödyntämisen ympäristölähtöisyys ei yksinään luo yritykselle kilpailuetua, vaan se on kyettävä yhdistämään asiakkaiden ja markkinoiden vaatimuksiin (Itami – Roehl 1987, 32; Prahalad – Hamel 1990, 84). Resurssien, kilpailukykytekijöiden ja asiakkaiden tarpeiden pohjalta valitulla kilpailustrategialla yritys pyrkii saavuttamaan kilpailuetua muihin markkinoilla oleviin yrityksiin nähden (Prahalad – Hamel 1990, 83–84; Barney 1991, 112). Tässä yrityksen ympäristölähtöisen kilpailukyvyn käsittely rajataan yrityksen ympäristölähtöisiin resursseihin ja prosesseihin. Tutkimuksessa ei keskitytä tarkastelemaan niiden vaikutusta yrityksen saavuttamaan kilpailuetuun tai yrityksen kilpailustrategioihin, vaikka resurssiperusteista näkemystä on usein hyödynnetty tähän tarkoitukseen (vrt. Bamberger 1989; Barney 1991; Grant 1991).

Testaamalla maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn mallia pyritään selvittämään, onko mallin eri tekijöistä löydettävissä muita enemmän ympäristölähtöiseen kilpailukykyyn vaikuttavia tekijöitä, ja esiin-

tyykö mallin tekijöiden ja ympäristölähtöisen kilpailukyvyn välillä oletettuja vaikutussuhteita.

2.5 Aineisto ja tutkimusmenetelmä

Tutkimuksen aineisto kerättiin vuoden 2003 huhti–toukokuussa postikirjekyselyllä 2 068 otokseen kuuluneelta Suomen Kuljetus ja Logistiikka SKAL ry:n jäseneltä (SKAL:n jäsenrekisterissä oli aineiston keruun ajankohtana yhteensä 8 188 jäsenyritystä). Otantamenetelmänä käytettiin ositettua otantaa, jossa kehikkoperusjoukko jaettiin kolmeen ositteeseen: ympäristökouluttautuneisiin yrityksiin, suoritealayhdistysten jäseniin ja muihin jäseniin. Kyselyyn saatiin 483 vastausta, joista 433 lomaketta hyväksyttiin tutkimukseen. Vastausprosentti oli vajaa 21 %.

Aineiston kato- ja edustavuusanalyysissa ilmeni, että henkilöstömäärältään ja liikevaihdoltaan pienemmät yritykset olivat olleet vähemmän aktiivisia vastaamaan kuin suuremmat yritykset. Aineiston edustavuutta arvioitaessa ilmeni kuitenkin, että pienemmät yritykset olivat hieman yliedustettuja kehikkoperusjoukkoon verrattuna. Aineistoa voidaan silti pitää edustavana, koska suurin osa suomalaisista maantiekuljetusyrityksistä on kooltaan pieniä.

Tutkimuksen mallia testattiin polkuanalyyseilla tutkimuksen eri osaaineistoissa. Polkuanalyyseissa käytettiin AMOS (Analysis of Moment Structures) 5.0-ohjelmistoa. Tutkimuksen käsitemallia testattiin myös rakenneyhtälömallinnuksella, mutta testausta ei saatu suoritettua analyysimenetelmän mallinnustekniikan rajoitusten ja teknisten syiden, kuten havaintomuuttujien voimakkaan multikollineaarisuuden, liiallisten havaintomuuttujien ja mittausvirheiden korrelaatioiden, vuoksi. Näihin liittyvien tarvittavien muunnostenkaan jälkeen mallia ei kyetty testaamaan rakenneyhtälömallinnuksella.

Polkuanalyyseissa testattavat muuttujat olivat summamuuttujia, joiden käyttö on selkein ero polkuanalyysien ja rakenneyhtälö-mallissa tehtyjen polkumallien testaamisen välillä (Grapentine 2000, 16). Summamuuttujien luotettavuutta arvioitiin Cronbachin α-kertoimella. Muuttujien luotettavuus vaihteli eri aineistoissa heikosta (uudistaminen α=0,34–0,53) erinomaiseen (ympäristölähtöinen kilpailukyky α=0,92–0,93). Suurimmassa osassa mallin muuttujista luotettavuus oli hyvä (α~0,70), joten tutkimusta voidaan pitää validina rakennevaliditeetin osalta (vrt. Arbnor – Bjerke 1997, 238).

2.6 Tulokset ja johtopäätökset

Tutkimuksessa asetetut hypoteesit jäivät suurimmilta osin voimaan (taulukko 2). Tutkimuksessa asetettuja hypoteeseja testaamalla ilmeni, että etukäteen oletettu vaikutussuhde uudistamisen ja ympäristölähtöisen kilpailukyvyn välillä ei saanut empiiristä vahvistusta yhdessäkään aineistossa. Näin ollen voidaan olettaa, että uudistamisella ei ole suoraa vaikutusta maantiekuljetusyrityksen ympäristölähtöiseen kilpailukykyyn. Polkuanalyyseissa löytyi uusi vaikutussuhde uudistamisen ja yrityksen yli ulottuvien prosessien välillä. Tätä kautta syntyi myös epäsuora vaikutussuhde uudistamisen ja kilpailukyvyn välille, jonka oletetaan syntyvän siitä, että uudistaminen vaikuttaa enemmän yrityksen sisäiseen kuin yrityksestä ulospäin suuntautuvaan toimintaan. Yrityksessä tapahtuvan uudistamisen, kuten henkilöstön ympäristöosaamisen parantumisen, oletetaan vaikuttavan yrityksen toiminnan tehostamiseen ja kustannussäästöihin. Tämä oletus sai vahvistusta jokaisen aineiston polkuanalyyseissa.

Taulukko 2. Tutkimuksen hypoteesien tarkastelu eri aineistojen polkuanalyysien perusteella.

		Ympäristökouluttautuneet (n=182)		Suoritealayhdistysten jäsenet (n=135)		Muut jäsenet (n=116)		Kokonaisaineisto (n=433)	
Hypoteesi	**Polku**	**β**	**p-arvo**	**β**	**p-arvo**	**β**	**p-arvo**	**β**	**p-arvo**
P_{1-1}	FYY→UUD	**0,03**	**0,650**	0,17	0,018	0,17	0,014	0,10	0,010
P_{1-2}	FYY→YLI	0,23	<0,001	**0,11**	**0,192**	0,30	<0,001	0,22	<0,001
P_{1-3}	FYY→YHT	0,14	0,038	***-0,18***	***0,052***	0,26	0,003	**0,05**	**0,279**
P_{2-1}	OSA→KK	0,18	<0,001	***0,15***	***0,062***	**0,05**	**0,620**	0,14	0,003
P_{2-2}	OSA→UUD	0,66	<0,001	0,62	<0,001	0,65	<0,001	0,66	<0,001
P_{2-3}	OSA→YLI	**0,06**	**0,442**	0,28	0,003	**0,01**	**0,952**	0,11	0,028
P_{2-4}	OSA→YHT	0,24	0,001	0,21	0,026	0,34	<0,001	0,25	<0,001
P_{3-1}	ORG→YLI	0,27	<0,001	0,17	0,031	0,33	<0,001	0,22	<0,001
P_{3-2}	ORG→YHT	0,17	0,038	0,23	0,009	***0,17***	***0,075***	0,16	0,002
P_{4-1}	UUD→KK	**0,09**	**0,196**	**0,05**	**0,498**	**0,03**	**0,770**	**0,06**	**0,179**
P_{4-2}	YLI→KK	0,25	0,017	0,36	<0,001	0,36	<0,001	0,32	<0,001
P_{4-3}	YHT→KK	0,38	<0,001	0,38	<0,001	0,45	<0,001	0,39	<0,001
Uudet vaikutussuhteet									
	UUD→YLI	0,34	<0,001	0,32	<0,001	0,31	<0,001	0,37	<0,001
	YLI→YHT	0,25	<0,001	0,43	<0,001	–	–	0,30	<0,001

Taulukossa on lihavoitu tutkimuksessa hylätyt hypoteesit, ja yli viiden prosentin merkitsevyystasolla hyväksytyt hypoteesit on lihavoitu ja kursivoitu.

Polkuanalyyseissa havaittiin myös toinen uusi vaikutussuhde yrityksen yli ulottuvien prosessien ja yhteistyön välillä. Tämän vaikutussuhteen oletetaan perustuvan siihen, että yrityksen toiminnan yli ulottuvien prosessien ympäristölähtöisyyden parantaminen vaikuttaa yrityksen mahdollisuuksiin hyödyntää

ympäristölähtöisyyteen perustuvaa yhteistyötä asiakkaiden ja yhteistyökumppaneiden kanssa.

Polkuanalyysien tuloksista voidaan olettaa, että alkuperäisestä mallista tulisi poistaa uudistamisen ja ympäristölähtöisen kilpailukyvyn välinen vaikutussuhde. Tämän sijaan havaitut uudet vaikutussuhteet voisivat olla liitettävissä malliin. Uusien vaikutussuhteiden lisäämistä malliin puoltaa se, että molemmat kokonaisaineistossa ilmenneet vaikutussuhteet esiintyivät myös ympäristökoulutettujen yritysten ja suoritealayhdistysten jäsenten aineistoissa, joissa vastaajat poikkeavat taustoiltaan toisistaan. Tosin muiden jäsenten keskuudessa yrityksen yli ulottuvien prosessien ja yhteistyön välinen vaikutussuhde ei saanut vahvistusta.

Eri aineistoissa hylättiin uudistamisen suoran vaikutuksen (P_{4-1}) lisäksi eri hypoteeseja. Ympäristökouluttautuneiden yritysten aineistossa hypoteesit P_{1-1} ja P_{2-3} hylättiin. Fyysisten resurssien ja uudistamisen välisen hypoteesin hylkäämisen oletetaan johtuvan siitä, että ympäristökouluttautuneissa yrityksissä uudistaminen nähdään liittyvän enemmän henkilöstön ympäristöosaamisen kehittämiseen kuin yrityksen fyysisten resurssien ympäristölähtöisyyteen. Jälkimmäisen ympäristöosaamisen ja yrityksen yli ulottuvien prosessien välisen vaikutussuhteen hylkäämisen oletetaan johtuvan siitä, että ympäristökouluttautuneissa yrityksissä ympäristöosaaminen on nivoutunut kiinteästi yrityksen yli ulottuviin prosesseihin, eikä niiden välillä nähdä erillistä yhteyttä.

Suoritealayhdistysten jäsenten keskuudessa uudistamisen suoran vaikutuksen lisäksi hylättiin fyysisten resurssien ja yrityksen yli ulottuvien prosessien välinen vaikutussuhde (P_{1-2}). Tämän oletetaan johtuvan siitä, että tämän aineiston yrityksissä yrityksen yli ulottuvat prosessit liittyvät enemmän yrityksen toiminnan kehittämiseen kuin fyysisten resurssien käytön tehostamiseen. Muiden jäsenten aineistossa ympäristöosaamisella ei näyttänyt olevan suoraa vaikutusta kilpailukykyyn (P_{2-1}). Samoin ympäristöosaamisen ja yrityksen yli ulottuvien ympäristölähtöisten prosessien välinen vaikutussuhde (P_{2-3}) hylättiin. Nämä tulokset olivat selvä poikkeus muiden aineistojen polkuanalyyseihin verrattuna. Tulokset ilmentävät sitä, että muiden jäsenten keskuudessa ympäristöosaaminen ei ole yhtä tärkeässä asemassa kuin muissa aineistoissa, ja ympäristölähtöisen kilpailukyvyn nähdään syntyvän muiden tekijöiden, kuten fyysisten resurssien, perusteella.

Eri aineistojen polkuanalyyseja yhdistää se, että yhteistyöllä osoittautui olevan jokaisessa aineistossa suoraa vaikutusta (β=0,38–0,45) ympäristölähtöiseen kilpailukykyyn. Tulos osoittaa, että asiakkaiden ja yhteistyökumppaneiden kanssa tapahtuva ympäristölähtöinen yhteistyö vaikuttaa voimakkaasti maantiekuljetusyrityksen ympäristölähtöiseen kilpailukykyyn. Samoin yrityksen yli ulottuvilla prosesseilla ilmeni olevan voimakasta suoraa vaikutusta (β=0,25–0,36) ympäristölähtöiseen kilpailukykyyn.

Ympäristölähtöisten fyysisten resurssien muita tekijöitä pienempi vaikutus ilmentää sitä, että ympäristölähtöiset fyysiset resurssit eivät yksistään riitä maantiekuljetusyrityksen ympäristölähtöisen kilpailukyvyn perustaksi. Tämä on loogista, koska maantiekuljetuskaluston ympäristölähtöisyyttä ohjataan yhteiskunnallisesti (vrt. EU:n asettamat EURO-päästörajat), jolloin uutena hankittava kalusto on ympäristölähtöistä. Jokaisella maantiekuljetusyrityksellä on tällöin teoriassa mahdollisuus hyödyntää sellaisia fyysisiä resursseja, jolla yksi tai muutama yritys voisi saavuttaa ympäristölähtöistä kilpailukykyä (vrt. Dierickx – Cool 1989; Barney 1991). Tämä ei kuitenkaan kumoa resurssiperusteisen näkemyksen oletuksia yrityksen ympäristölähtöisestä kilpailukyvystä. Ympäristölähtöisillä fyysisillä resursseilla yksittäinen yritys kykenee varmistamaan vähintään tasa-arvoisen aseman markkinoilla muihin yrityksiin verrattuna. Vaikka yksittäisen yrityksen ei olisi mahdollista luoda fyysisillä resursseilla muita parempaa kilpailukykyä, se kykenee ylläpitämään toimintakykyään ja pysymään mukana kilpailussa (vrt. Barney 1991, 106–107).

Tutkimuksen hypoteesien testaamisen ohella polkuanalyyseilla kyettiin selvittämään maantiekuljetusyrityksen ympäristölähtöisten resurssien ja prosessien vaikutusta ympäristölähtöiseen kilpailukykyyn (taulukko 3). Yrityksen yli ulottuvilla prosesseilla ja yhteistyöllä osoittautui olevan voimakkainta kokonaisvaikutusta maantiekuljetusyritysten ympäristölähtöiseen kilpailukykyyn eri aineistoissa. Lisäksi yrityksen ympäristöosaamisella oli muiden jäsenien aineistoa lukuun ottamatta lähes yhtä voimakasta kokonaisvaikutusta ympäristölähtöiseen kilpailukykyyn.

Taulukko 3. Maantiekuljetusyrityksen ympäristölähtöisten resurssien ja prosessien kokonaisvaikutukset ympäristölähtöiseen kilpailukykyyn.

	Ympäristökouluttautuneet	**Suoriteala-yhdistysten jäsenet**	**Muut jäsenet**	**Kokonaisaineisto**
Fyysiset resurssit	0,14	-0,04	0,24	0,14
Ympäristöosaaminen	***0,35***	***0,48***	0,23	***0,39***
Organisatoriset toimintatavat	0,16	0,18	0,19	0,16
Uudistaminen	0,12	0,15	0,11	0,16
Yrityksen yli ulottuvat prosessit	***0,35***	**0,52**	***0,36***	**0,43**
Yhteistyö	**0,38**	***0,38***	**0,45**	***0,39***

Taulukossa on lihavoitu vaikutukseltaan voimakkaimmat tekijät eri aineistoissa. Muut voimakkaat tekijät on lihavoitu ja kursivoitu.

Muut jäsenet erottuivat muiden aineistojen yrityksistä. Heidän kohdallaan fyysisillä resursseilla oli selvästi enemmän kokonaisvaikutusta ympäristölähtöiseen kilpailukykyyn kuin muissa aineistoissa. Tämä kuvaa, että osa yrityksistä suhtautuu ympäristölähtöisyyteen selvästi muita välineellisemmin.

Tulokset ovat myös resurssiperusteisen näkemyksen hyödyntämisen kannalta olennaisia. Yrityksen yli ulottuvien prosessien, ympäristöosaamisen ja yhteistyön kaltaiset resurssit ja prosessit edellyttävät usein niihin liittyvän osaamisen ja tiedon kumuloitumista ja kertymistä yrityksen toiminnassa (Dierickx – Cool 1989, 1505). Tällaisten resurssien ja prosessien imitointi vaikeutuu, ja niillä on potentiaalia strategisiksi kilpailukyvyn lähteiksi (Amit – Schoemaker 1993, 39). Mitä vaikeampaa kilpailijoiden on omaksua yrityksen yli ulottuviin prosesseihin, ympäristöosaamiseen tai yhteistyön liittyvää toimintaa, sitä paremmat mahdollisuudet yksittäisellä maantiekuljetusyrityksellä on saavuttaa niillä kilpailukykyä.

Tutkimuksen osoittama keskeinen tulos yrityksen yli ulottuvien ympäristölähtöisten prosessien vaikutuksesta ympäristölähtöiseen kilpailukykyyn on looginen. Jos ympäristölähtöisyyttä kehitetään siten, että myös toiminnan kustannukset vähenevät, yrityksen kilpailukyky paranee (vrt. Lahti-Nuuttila 1998, 19). Toiminnan tehostamiseen ja kustannusten vähentämiseen tähtäävien toimenpiteiden ohella nämä prosessit sisältävät ympäristöjärjestelmän hyödyntämiseen liittyviä ulottuvuuksia. Tällöin yrityksen ympäristölähtöisen kilpailukyvyn haasteena ovat ympäristöjärjestelmiin liittyvät vaatimukset ympäristölähtöisen toiminnan läpinäkyvyydestä. Ympäristöjärjestelmän nivoutuminen osaksi yrityksen normaalia toimintaa, resursseja ja prosesseja vaikeuttaa kuitenkin siihen perustuvan kilpailukyvyn jäljittelyä (vrt. Hart 1995, 1000; Russo – Fouts 1997, 538), jolloin avoimuus ei välttämättä estä kilpailukyvyn saavuttamista. Avoimuus voi toisaalta parantaa yrityksen ympäristölähtöistä mainetta ja imagoa (Kleiner 1991, 41) sekä vahvistaa yrityksen ympäristölähtöistä kilpailukykyä.

Ympäristöosaamisen voimakas kokonaisvaikutus kilpailukykyyn on myös tärkeä tulos. Henkilöstön ympäristöosaaminen ja sen kumuloituminen yrityksen toiminnassa on eräs kilpailukyvyn lähde resurssiperusteisen näkemyksen mukaan (vrt. Barney 1991, 101). Ympäristöosaaminen ei ole itsessään tuottava resurssi (Russo – Fouts 1997, 537), joten sen vaikutus syntyy muiden resurssien välityksellä. Yrityksen kilpailukyvyn kehittymisen kannalta olennaista on se, että ympäristöosaamista kyetään kumuloimaan yrityksen toimintaan pysyväksi ominaisuudeksi. Tutkimuksen tulokset ympäristöosaamisen vaikutuksesta kilpailukykyyn ja yhteydestä yrityksen muiden resurssien kanssa osoittavat, että ympäristöosaaminen on keskeinen edellytys maantiekuljetusyrityksen ympäristölähtöiselle toiminnalle ja kilpailukyvylle.

Tutkimuksen tulokset vahvistavat oletuksia siitä, että asiakkailla on merkitystä maantiekuljetusyrityksen ympäristölähtöiselle kilpailukyvylle (ks. Stenholm 2004). Asiakkaiden ja yhteistyökumppaneiden kanssa tapahtuva yhteistyön vaikutus ympäristölähtöiseen kilpailukykyyn oli voimakasta eri aineistoissa. Yhteistyön merkitystä on korostettu myös aikaisemmissa tutkimuksissa, ja esimerkiksi asiakkaan

ja kuljetusyrityksen välisen kommunikaation puutteen on havaittu haittaavan merkittävästi maantiekuljetusyrityksen ympäristölähtöisyyden kehittämistä (Björklund 2001, 14). Tämän tutkimuksen tulokset osoittavat, että ympäristölähtöisyyteen liittyvällä yhteistyöllä, kuten informaation jakamisella asiakkaan ja kuljetusyrityksen välillä, voidaan edistää maantiekuljetusyrityksen ympäristölähtöistä kilpailukykyä.

Lähteet

Amit, Raphael – Schoemaker, Paul J. H. (1993) Strategic Assets and Organisational Rent. *Strategic Management Journal*, 14 (1): 33–46.

Arbnor, Ingeman – Bjerke, Björn (1997) *Methodology for Creating Business Knowledge*. 2nd edition. Sage Publications: London.

Bagchi, Prabir K. – Skjött-Larsen, Tage (1995) European Logistics in Transition: Some Insights. *The International Journal of Logistics Management*, 6 (2): 11–24.

Ballou, Ronald H. (1987) *Basic Business Logistics. Transportation, Materials Management, Physical Distribution.* 2nd edition. Prentice-Hall, New Jersey: USA.

Bamberger, Ingolf (1989) Developing Competitive Advantage in Small and Medium-size Firms. *Long Range Planning*, 22 (5): 80–88.

Barney, Jay (1986a) Organisational Culture: Can It Be a Source of Sustained Competitive Advantage? *Academy of Management Review*, 11 (3): 656–665.

Barney, Jay (1986b) Strategic Factor Markets: Expectations, Luck, and Business Strategy. *Management Science*, 32 (10): 1231–1241.

Barney, Jay (1991) Firm Resources and Sustained Competitive Advantage. *Journal of Management*, 17 (1): 99–120.

Bartels, Robert (1976) *The History of Marketing Thought*. 2nd edition. Grid. Ohio: USA.

Björklund, Maria (2001) Environmentally Responsible Transportation. *Paper presented at the 6th ELA Doctorial Workshop*, Monchy-St. Eloi, France, July 6–7, 2001.

Björklund, Maria (2002) *Environmental Considerations when Selecting Transport Solutions – A Contribution to Shippers' Decision Process.* Thesis for the degree Licentiate in Engineering. Department of Industrial Management and Logistics, Engineering Logistics. Lund University: Sweden.

Black, Ian – Peters, Melvyn (1997) The Sustainable Supply Chain – a UK Perspective. In: *Common Europe Economic Dilemmas of Transport*

and Ecology, edited by Tomasz DolHgowski, 131–150. Warsaw School of Economics. World Economic Faculty: Warsaw, Poland.

Bloemhof-Ruwaard, Jacqeline M. – van Beek, Paul – Hordijk, Leen – Van Wassenhoe, Luk N. (1995) Interactions Between Operational Research and Environmental Management. *European Journal of Operational Research*, 85 (2): 229–243

Bonifant, Benjamin C. – Arnold, Matthew B. – Long, Frederik J. (1995) Gaining Competitive Advantage Through Environmental Investments. *Business Horizons*, 38 (4): 37–47.

Bowen, Frances E. – Cousins, Paul D. – Lamming, Richard C. – Faruk, Adam C. (2001) The Role of Supply Management Capabilities in Green Supply. *Production and Operations Management*, 10 (2): 174–189.

Buchholz, Rogene A. (1998) Principles of Environmental Management. The Greening of Business. 2nd edition. Prentice Hall, New Jersey: USA.

Cairncross, Frances (1991) Ympäristömme hinta: Päättäjien ja yritysten uudet haasteet. Rara Avis: Helsinki.

Carter, Craig R. – Ellram, Lisa M. (1998) Reverse Logistics: A Review of the Literature and Framework for Future Investigation. *Journal of Business Logistics*, 19 (1): 85–102.

Coates, Theresa T. – McDermott, Christopher M. (2002) An Exploratory Analysis of New Competencies: A Resource Based View Perspective. *Journal of Operations Management*, 20 (5): 435–450

Collis, David J. – Montgomery, Cynthia A. (1995) Competing on Resources: Strategy in the 1990s. *Harvard Business Review*, 73 (4): 118–128.

Conner, Kathleen R. (1991) A Historical Comparison of Resource-Based Theory and Five Schools of Thought Within Industrial Organisation Economics: Do We Have a New Theory of the Firm? *Journal of Management*, 15 (1): 121–154.

Cooper, James – Browne, Michael – Peters, Melvyn (1992) Green Logistics. In: *European Logistics. Markets, Management and Strategy,* edited by James Cooper – Michael Browne – Melvyn Peters, 270–292. Blackwell Business Ltd.: London.

Coyle, John J. – Bardi, Edward (1980) *The Management of Business Logistics*, 2nd edition. West Publishing Company, ST. Paul: USA.

Coyle, John J. – Bardi, Edward J. – Cavinato, Joseph L. (1990) *Transportation*, 3rd edition. West Publishing Company, ST. Paul: USA.

Crosbie, Liz – Knight, Ken (1995) *Strategy for Sustainable Business – Environmental Opportunity and Strategic Choice*. McGraw-Hill Book Company: London.

Day, George S. (1994) The Capabilities of Market-Driven Organisations. *Journal of Marketing*, 58 (4): 37–52.

Dean, Thomas J. – Brown, Robert L. (1995) Pollution Regulation as a Barrier to New Firm Entry: Initial Evidence and Implications for Future Research. *Academy of Management Journal*, 38 (1): 288–303.

Dierickx, Ingemar – Cool, Karel (1989) Asset Stock Accumulation and Sustainability of Competitive Advantage. *Management Science*, 35 (12): 1504–1511.

EEA, European Environment Agency (2000) *Environmental Signals 2000*. European Environment Agency Regular Indicator Report. Environmental Assessment Report No. 6: Copenhagen, Denmark.

Enarsson, Leif (1998) Evaluation of Suppliers: How to Consider the Environment. *International Journal of Physical Distribution and Logistics Management*, 28 (1): 5–17.

Engelhardt, Juliusz (1997) How Should the Railroads Profit from their Environmental Advantage over the Competitors. In: *Common Europe Economic Dilemmas of Transport and Ecology*, edited by Tomasz DolHgowski, 186–199. Warsaw School of Economics. World Economic Faculty: Warsaw, Poland.

European Commission (2001a) *Green Paper – Towards an European Strategy for the Security of Energy Supply*. Office for Official Publications of the European Communities: Brussels, Luxembourg.

European Commission (2001b) *Panorama of Transport – Statistical Overview of Road, Rail, Inland Waterways and Air Transport in the European Union.* Office for Official Publications of the European Communities: Brussels, Luxembourg.

European Commission (2001c) *White Paper – European Transport Policy for 2010: Time to Decide.* Office for Official Publications of the European Communities: Brussels, Luxembourg.

Fahy, John (2000) The Resource-Based View of the Firm: Some Stumbling-Blocks on the Road to Understanding Sustainable Competitive Advantage. *Journal of European Industrial Training*, 24 (2–4): 94–104.

Florida, Richard – Atlas, Mark – Cline, Matt (2001) What Makes Companies Green? Organisational and Geographic Factors in the Adoption of Environmental Practices. *Economic Geography*, 77 (3): 209–224.

Foss, Nicolai J. – Knudsen, Christian – Montgomery, Cynthia A. (1996) An Exploration of Common Ground: Integrating Evolutionary and Strategic Theories of the Firm. In: *Resource-Based and Evolutionary Theories of the Firm. Towards a Synthesis*, edited by Cynthia A. Montgomery, 1–17. Kluwer Academic Publishers: USA.

Goldsby, Thomas J. – Stank, Theodore P. (2000) World Class Logistics Performance and Environmental Responsible Logistics Practices. *Journal of Business Logistics*, 21 (2): 187–208.

Grant, Robert M. (1991) The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review*, 33 (3): 114–135.

Grapentine, Terry (2000) Path Analysis vs. Structural Equation Modeling. *Marketing Research,* 12 (3): 13–20.

Greenan, Kate – Humphreys, Paul – McIvor, Ronan (1997) The Green Initiative: Improving Quality and Competitiveness. *European Business Review*, 97 (5): 208–214.

Haapanen, Mikko – Oksanen, Reijo (1986) *Kuljetustalous.* Ekondata Oy: Länsi-Savo, Mikkeli.

Hall, Richard (1993) A Framework Linking Intangible Resources and Capabilities to Sustainable Competitive Advantage. *Strategic Management Journal,* 14 (8): 607–618.

Hamel, Gary (2000) *Leading the Revolution.* Harvard Business School Press: Boston, USA.

Hanna, Mark D. – Newman, W. Rocky (1995) Operations and Environment: An Expanded Focus for TQM. *International Journal of Quality & Reliability Management*, 12 (5): 38–53.

Hart, Stuart L. (1995) A Natural-Resource-Based View of the Firm. *Academy of Management Review*, 20 (4): 986–1014.

Hoffman, Andrew J. (2001) *From Heresy to Dogma – An Institutional History of Corporate Environmentalism.* Stanford Business Books: Stanford, California.

Hooley, Graham – Greenley, Gordon – Fahy, John – Cadogan, John (2001) Market-focused Resources, Competitive Positioning, and Firm Performance. *Journal of Marketing Management*, 17 (5–6): 503–520.

Hoskisson, Robert E. – Hitt, Michael A. – Wan, William P. – Yiu, Daphne (1999) Theory and Research in Strategic Management: Swings of a Pendulum. *Journal of Management*, 25 (3): 417–456.

Itami, Hiroyuki – Roehl, Thomas W. (1987) *Mobilizing Invisible Assets*. Harvard University Press: London, England.

Janhunen, Antero (1997) Ekologistiikka. Teoksessa: *Businesslogistiikka*, toimittanut Risto Pouri, 168–195. Suomen Logistiikkayhdistys: Helsinki.

Jennings, P. Devereaux – Zandbergen, Paul A. (1995) Ecologically Sustainable Organisations: An Institutional Approach. *Academy of Management Review*, 20 (4): 1015–1052.

Kalenoja, Hanna – Kallberg, Harri (1998) *Liikenteen energiankulutus, päästöt ja ympäristövaikutukset.* Tampereen teknillinen korkeakoulu. Liikenne- ja kuljetustekniikka, julkaisu 30. Tampere.

Kalenoja, Hanna – Mäntynen, Jorma – Kallberg, Harri – Jokipii, Tuomas – Korpela, Kari – Kulmala, Mika (2002) *Liikenteen hiilidioksidipäästöjen vähentämismahdollisuudet Suomessa.* Tampereen teknillinen korkeakoulu. Liikenne- ja kuljetustekniikka, tutkimuksia 48. Tampere.

Kallio, Tomi J. (2000) *Where Do We Stand? Reflections on Environmental Management and the Prevailing Problems in Creating Sustainable Business-nature Relationship.* Publications of the Turku School of Economics and Business Administration, Series Discussion and Working Papers 8:2000. Turku.

Kent, John L. – Parker, R. Stephen – Luke, Robert H. (2001) An Empirical Examination of Shipper Perceptions of Service-Selection Attributes in Five Truckload Industry Segments. *Transportation Journal*, 41 (1): 26–36.

Ketola, Tarja (1999) *A Map of Neverland: The Role of Policy in Strategic Environmental Management.* Publications of the Turku School of Economics and Business Administration, Series A-4:1999. Turku.

Kleiner, Art (1991) What Does It Mean to Be Green? *Harvard Business Review*, 69 (4): 38–47.

Lahti-Nuuttila, Kimmo (1998) *Yrityksen ympäristökilpailukyvyn teoreettinen tarkastelu*. ETLA, Elinkeinoelämän Tutkimuslaitos, Keskusteluaiheita No. 637. Helsinki.

Linnanen, Lassi – Markkanen, Elina (1997) Arvoketjuajattelu ympäristöosaamisen kehittämisessä – esimerkkinä elintarviketuotannon arvoketju. *Liiketaloudellinen aikakauskirja*, 46 (1): 63–75.

Linnanen, Lassi – Markkanen, Elina – Ilmola, Leena (1997) *Ympäristöosaaminen – kestävän kehityksen haaste yritysjohdolle.* Otaniemi Consulting Group Oy: Helsinki.

Lovio, Raimo – Kuisma, Mika (2004) Ympäristösuojelun ja yritystalouden yhteensovittamisen haaste. Teoksessa: *Ympäristö ja liiketoiminta*, toimittanut Eva Heiskanen, 17–49. Gaudeamus: Helsinki.

McIntyre, Kristie – Smith, Hugh A. – Henham, Alex – Pretlove, John (1998) Logistics Performance Measurement and Greening Supply Chains: Diverging Mindsets. *The International Journal of Logistics Management*, 9 (1): 57–67.

McKinnon, Alan C. – Stirling, Iain – Kirkhope, Justin (1993) Improving the Fuel Efficiency of Road Freight Operations. *International Journal of Physical Distribution and Logistics Management*, 23 (9): 3–11.

McKinnon, Alan C. (1999) A Logistical Perspective on the Fuel Efficiency of Road Freight Transport. *Paper presented at the "Improving Fuel Efficiency in Road Freight: The Role of Information Technologies"-conference*, Paris, France, February 23, 1999.

Meyer, Beata – Malachowski, Krzysztof (1997) Selected Aspects of Transportation Company Environmental Policy. In: *Common Europe Economic Dilemmas of Transport and Ecology*, edited by Tomasz DolHgowski, 374–379. Warsaw School of Economics. World Economic Faculty: Warsaw, Poland.

Min, Hokey (2002) The Impact of Lumper Costs, Empty Miles, and Shipment Size on the Profitability of Motor Carriers: A Case Study. *Journal of Transportation Management*, 13 (1): 1–7.

Murphy, Paul R. – Poist, Richard F. (2000) Green Logistics Strategies: An Analysis of Usage Patterns. *Transportation Journal*, 40 (2): 5–16.

Murphy, Paul R. – Poist, Richard F. – Braunschwieg, Charles D. (1994) Management of Environmental Issues in Logistics: Current Status and Future Potential. *Transportation Journal*, 34 (1): 48–56.

Murphy, Paul R. – Poist, Richard F. – Braunschweig, Charles D. (1995) Role and Relevance of Logistics to Corporate Environmentalism: An Empirical Assessment. *International Journal of Physical Distribution and Logistics Management*, 25 (2): 5–19.

Mäkelä, Kari – Tuominen, Anu – Pääkkönen, Esa (2003) *Suomen liikenteen päästöjen laskentajärjestelmä, LIPASTO 2002.* VTT Rakennus- ja yhdyskuntatekniikka. Tutkimusraportti RTE 1378/03. Espoo.

Mäntylä, Miia – Syrjä, Tiina – Vaino, Arttu – Vehkala, Minna-Maaria – Wuori, Olli (2001) *Pk-yritysten ekokilpailukyky.* Vaasan yliopisto. Levón-instituutti. Julkaisuja No. 86: Vaasa.

O´Laughlin, Kevin A. – Cooper, James – Caboel, Eric (1993) *Reconfiguring European Logistics Systems*, Council of Logistics Management, Oak Brook: Illinois, USA.

Ojala, Päivi (2000) *Developing Environmental Management for Finnish International Road Carriers.* Pro Graduate thesis at the Degree Programme in International Business. Häme Polytechnic: Valkeakoski.

Oksanen, Reijo (2003) *Kuljetusten toimintolaskennan sovellukset ja toteutus.* Liikenne- ja viestintäministeriön julkaisuja 17/2003. Helsinki.

Olavarrieta, Sergio – Ellinger, Alexander E. (1997) Resource-Based Theory and Strategic Logistics Research. *International Journal of Physical Distribution & Logistics Management*, 27 (9–10): 559–587.

Penman, Ivy (1994) Environmental Concern: Implications for Supply Chain Management. In: *Logistics and Distribution Planning. Strategies for Management,* edited by James Cooper, 2nd edition, 164–172. Kogan Page Limited: London.

Penrose, Edith T. (1959) *The Theory of the Growth of the Firm.* Basil Blackwell: Oxford, Great Britain.

Pohjola, Tuula (1999) *Environmental Modeling System – A Framework for Cost-Effective Environmental Decision-Making Processes*. FEMDI Research Series No. 12. Helsinki.

Porter, Michael E. – van der Linde, Claas (1995) Green and Competitive. Ending the Stalemate. *Harvard Business Review*, 73 (5): 120–134.

Prahalad, C. K. – Hamel, Gary (1990) The Core Competence of the Corporation. *Harvard Business Review*, 68 (3): 79–91.

Punakivi, Mikko – Mäkinen, Ismo (1997) *City-logistiikkahankkeet Saksassa.* Teollisuussihteeriraportti 3/1997, Teknologian kehittämiskeskus: Helsinki.

Rao, Kant – Grenoble, William – Young, Robert (1991) Traffic Congestion and JIT. *Journal of Business Logistics*, 12 (1): 105–121.

Rodrigue, Jean-Paul – Slack, Brian – Comtois, Claude (2001) Green Logistics (The Paradoxes of). In: *The Handbook of Logistics and Supply-Chain Management*, edited by A. M. Brewer, K. J. Button and D. A. Hensher, 1–11. Pergamon/Elsevier: London.

Rodriguez, Miguel A. – Ricart, Joan E. – Sanchez, Pablo (2002) Sustainable Development and the Sustainability of Competitive Advantage: A Dynamic and Sustainable View of the Firm. *Creativity and Innovation Management*, 11 (3): 135–146.

Russo, Michael V. – Fouts, Paul A. (1997) A Resource-Based Perspective on Corporate Environmental Performance and Profitability. *Academy of Management Journal*, 40 (3): 534–559.

Short, Jack (1995) Freight Transport as an Environmental Problem. *World Transport Policy & Practice*, 1 (2): 7–10.

Shrivastava, Paul (1995) Ecocentric Management for a Risk Society. *Academy of Management Review*, 20 (1): 118–137.

SKAL, Suomen Kuorma-autoliitto (2000) *Kustannuslaskennan ja neuvottelutaidon perusteet.* Helsinki.

Skjött-Larsen, Tage (2000) European logistics beyond 2000. *International Journal of Physical Distribution and Logistics Management*, 30 (5): 377–387.

Slater, Jim – Angel, Isabel Tirado (2000) The Impact and Implications of Environmentally Linked Strategies on Competitive Advantage: A Study of Malaysian Companies. *Journal of Business Research*, 47 (1): 75–89.

Stenholm, Pekka (2004) *Maantiekuljetusyrityksen ympäristölähtöinen kilpailukyky.* Turun kauppakorkeakoulun julkaisuja, Sarja A-15:2004. Turku.

Stock, James R. (2001) Doctoral Research in Logistics and Logistics-Related Areas: 1992–1998. *Journal of Business Logistics,* 22 (1): 125–256.

Suomen liikenne kestävän kehityksen tielle (1993) Teknillisten tieteiden akatemia 1993:1. Jyväskylä.

Suutari, Ulla (1999) *Elinkaariarviointi logistiikassa*. VTT Yhdyskuntatekniikka. Liikenne, logistiikka ja yhdyskunnat. Tutkimusraportti 500/1999. VTT: Espoo.

SVT (2003) *Energiaennakko 2002.* Energia 2003:1. Tilastokeskus: Helsinki.

Szymankiewicz, Jan (1993) Going Green: The Logistics Dilemma. *Logistics Information Management*, 6 (3): 36–44.

van Hoek, Remko I (1999) From Reversed Logistics to Green Supply Chains. *Supply Chain Management*, 4 (3): 129–134.

Wernerfelt, Birger (1984) A Resource-Based View of the Firm. *Strategic Management Journal*, 5 (2): 171–180.

Whitelegg, John (1993) *Transport for a Sustainable Future. The Case for Europe*. Belhaven Press: London.

Winter, Sidney G. (1996) Four Rs of Profitability: Rents, Resources, Routines, and Replication. In: *Resource-Based and Evolutionary Theories of the Firm. Towards a Synthesis*, edited by Cynthia A. Montgomery, 147–178. Kluwer Academic Publishers: USA.

Wu, Haw-Jan – Dunn, Steven C. (1995) Environmentally Responsible Logistics Systems. *International Journal of Physical Distribution and Logistics Management*, 25 (2): 20–38.

Internet-lähteet

Motiva (2002a) *Kuljetusala.* <http://www.motiva.fi/yjay/Kuljetusala>, luettu 25.9.2002.

Motiva (2002b) *Taloudellinen ajaminen.* <http://www.motiva.fi/yjay/Kuljetusala/Taloudellinen%20ajaminen?articles=yes>, luettu 25.9.2002.

SKAL, Suomen Kuorma-autoliitto (2002a) *Eri kuljetusmuotojen kuljetussuoritteet.* <http://www.skal.fi/asp/empty.asp?P=568&PS=root&template=printer&S=1&C=18434>, luettu 10.1.2003.

SKAL, Suomen Kuorma-autoliitto (2002b) *Kuorma-autoliikenteen kansantaloudellinen merkitys.* <http://www.skal.fi/asp/empty.asp?P=567&PS=root&template=printer&S=1&C=18426>, luettu 10.1.2003.

3. COOPERATION AND THE CAPACITY FOR CONTROL: REGULATORY STYLES AND THE EVOLVING INFLUENCE OF ENVIRONMENTAL REGULATIONS IN THE UK[9]

Andy Gouldson

Abstract

This paper seeks to contribute to the broader debate on better regulation by examining the origins and influence of different regulatory styles. More particularly, it examines the extent to which economic theories of cooperation can help to explain the presence of the cooperative regulatory style that has long been associated with the implementation of environmental regulations in the UK. After reporting the results of empirical research that focused on these issues, it concludes that cooperative regulatory styles are likely to depend upon a) the presence of inter-dependencies between regulators and firms, and either b) the presence of trust amongst stakeholders or c) the effective exclusion of those stakeholders from influence in the regulatory decision making process. Highlighting the importance of recent changes in each of these three areas in the UK, the paper explains the factors that have led to a shift away from a purely cooperative approach towards what has been termed a more `responsive' or `risk-based' approach. Recognising that such changes have been driven by concerns about the lack of transparency and accountability in the regulatory process, the paper concludes that such evolutions represent a form of institutional learning that is compatible with broader theories of ecological modernisation.

3.1 Introduction

In many spheres of public policy there has been a long running debate on the desirability of different regulatory styles. In the environmental sphere, this debate has often focused on the regulatory styles that are prevalent in the US and the UK, as these are often seen to lie at either end of a broad spectrum: the regulatory style adopted in the US has been characterised as the most rigid and adversarial of any industrial society, and that of the UK as the most flexible and cooperative (Vogel 1986). Although it is often assumed that regulatory

[9] A more thorough version of this paper was published in *Environmental Planning C,* 22: 4, 2004.

styles are deeply embedded in the cultures and institutions of a particular country, recently authors such as Löfstedt and Vogel (2001) have argued that the regulatory styles applied on either side of the Atlantic have started to converge. In the UK and other parts of Europe there are on-going attempts to make the close, cooperative approach to implementation more open and accountable, while in the US there have been attempts to make the adversarial approach more flexible and cooperative.

These developments are contentious because views on the desirability or otherwise of cooperation in the implementation process tend to be polarised. For those that Hutter (1997) terms the consensual theorists, co-operation between the regulators and the regulated can enable problems to be effectively resolved through collective action (Axelrod 1984, 1997; Glasbergen 1998; Lahusen 2000). However, for those that Hutter (1997) terms the conflict theorists, `the very conditions that foster the evolution of co-operation are also the conditions that promote the evolution of [regulatory] capture and indeed corruption' (Ayres – Braithwaite 1992, 55). Given these conflicting perspectives, it is important to know where cooperation comes from, what influence it has on different measures of policy performance and whether it is possible to exploit the advantages of cooperative approaches to implementation without encountering the disadvantages.

To consider these issues, this paper starts with an examination of contemporary debates on regulation and its reform, focusing particularly on the contribution that alternative approaches to implementation can make in the search for better regulation. It then goes on to analyse the extent to which those essentially economic theories of cooperation proposed by authors such as Axelrod (1984) and Scholz (1984, 1991) can be used to analyse the interactions that are at the heart of the implementation process. These theories indicate that inter-dependencies between the regulators and the regulated can establish incentives for cooperation. Whilst recognising that these theories have some value, the paper adds an important institutional dimension to the analysis, most notably by considering the extent to which the broader context for implementation shapes the resources that are available to the different actors and the ability of stakeholders to influence the implementation process.

On this basis, the paper goes on to examine the extent to which they can explain the ways in which the regulatory styles associated with the implementation of environmental regulations in the UK have evolved in recent years. This examination is based on the results of empirical research, which focused on the implementation and impact of Integrated Pollution Control (IPC) regulations in the north east of England. This research was conducted in two phases - the first in 1996/7, the second in 2001/2. By comparing and con-

trasting the regulatory styles adopted in each period, the analysis is able to highlight the significance of recent evolutions in regulatory practice.

The results of the analysis suggests that the origins of cooperation do indeed lie in the inter-dependence of regulators and firms and, following Scholz (1984, 1991), either in the presence of trusting stakeholders or in the effective exclusion of suspicious or antagonistic stakeholders. In relation to the former, the paper finds that regulators and firms were highly inter-dependent in the first phase of the research but that these inter-dependencies, and hence the incentives for cooperation, had diminished quite significantly by the second phase. In relation to the latter, the paper finds that suspicious stakeholders had little if any influence in the first phase, but that by the second phase they had gained more influence, not least because the regulators had become more concerned with issues of accountability and public confidence in the regulatory function. As a result, the analysis indicates that the incentives for cooperation in the implementation process have been eroded and that pressures for a change of regulatory style have become more pronounced over the period of the research.

The analysis finds that the response to these pressures for change was not straightforward. Initially, the regulators were reluctant to make the implementation process more open and accountable – believing that such changes would reduce its efficacy and efficiency. However, by the second phase, new responsive or risk-based approaches had emerged which enabled the regulators to cooperate with cooperative and compliant firms but which also enabled them to apply a gradually escalating range of sanctions when they encountered an uncooperative or non-compliant firm. By formalising the basis for such an approach and reporting its impact on the environmental performance of regulated firms, the regulators sought to maintain the benefits of a cooperative regulatory style whilst simultaneously making the implementation process more transparent and accountable. The paper concludes by discussing whether such developments are an example of the institutional learning that is central to broader theories of ecological modernisation.

3.2 Conceptual Arguments

3.2.1 Regulation and Its Reform

In recent years, interest in new forms of governance and in new policy instruments has grown. In part, this has been driven by criticisms of more traditional forms of command and control. These criticisms come in many forms; however, they are encapsulated in the comments of Gunningham and Grabosky

(1999, 4–5) who argue that approaches to regulation that rely on the application of command and control instruments alone `are not effective in delivering their purported goals; or efficient in doing so at least cost; nor do they perform well in terms of other criteria such as equity, administrative viability or political acceptability'. In other words, they suggest that when applied on their own command and control instruments perform badly in almost every respect.

Driven by such criticisms, many programmes of regulatory reform have sought to explore the potential of less intrusive and less centralised forms of government intervention (see for example Sigler – Murphy 1988; Ayres – Braithwaite 1992). Indeed, much has been made of the potential benefits of applying economic and information-based instruments, voluntary agreements and other enforced forms of self-regulation alongside more flexible and less interventionist forms of command and control regulation (Ayres – Braithwaite 1992; Baldwin – Scott – Hood 1998; Ogus 1999). However, it is important to note that policy frameworks based upon the application of command and control regulations have not so much been dismantled and discarded as reformed and built upon.

Many of these reforms relate not so much to the design of the instruments themselves as to the manner of their implementation. Indeed, as part of the search for better regulation there have been calls for a broader and more inclusive and cooperative conception of the regulatory decision making process. Such a process would be based not only on the direct involvement of government, business and other `targets' of regulation but also of a range of other interested actors and stakeholders (Ayres – Braithwaite 1992; Gunningham – Grabosky 1999). In this way it is argued that command and control regulation can become more responsive, both to the conditions faced by the private sector and to the concerns of the various stakeholders.

Whilst some have argued that such inclusive processes are desirable, others have argued that they are becoming an effective necessity. Ayres and Braithwaite (1992), for example, argue that as governments are limited by political and fiscal constraints they need to secure the support and harness the resources of the private sector to realise public objectives. Similarly, Hancher and Moran (1989) suggest that private organisations have commonly acquired important attributes of public status through their contribution to social objectives. Consequently, they argue that they should be invited into the public `regulatory space' to influence the policy process and regulatory decision-making. In essence, Hancher and Moran (1989) recognise the significance of inter-dependence between the regulators and the targets of regulation and hence the need for cooperation in regulatory decision-making processes.

Through the adoption of more open, inclusive and cooperative approaches to regulation, it is argued that the draw-backs associated with the hierarchical

imposition of command and control regulations can be reduced, that the capacities and resources of the private sector can be harnessed to improve the efficacy and efficiency of regulation, and that the regulatory process can be made more participatory and accountable (Ayres – Braithwaite 1992; Gunningham – Grabosky 1999; Rydin 1999). Such programmes of regulatory reform therefore seem to promise something for everyone.

As such, programmes of regulatory reform reflect aspects of the broader debate on ecological modernisation (see Hajer 1996 Mor – Spaargaren 2000; Young 2000). As Murphy and Gouldson (2001) recognise, ecological modernisation has been presented in a descriptive form, where it attempts to characterise changes in late-modern capitalistic societies, in a prescriptive form, where it calls for new forms of policy intervention to resolve some of the tensions that have prevailed between environment and economy, and in a discursive form, where it seeks to illuminate the ways in which different actors attempt to persuade each other of the merits of their views. Through the lens of ecological modernisation, programmes of regulatory reform can therefore be seen in a variety of ways: as an attempt to recognise and respond to some of the structural instabilities associated with industrial capitalism, as an attempt to emphasise the benefits of alternative forms of policy intervention and as an attempt to open up a `discursive space' within which the different actors are more able to further their interests. Whilst these theoretical perspectives on the broader context for regulation are clearly relevant, the bulk of the discussion within this paper will focus on more prosaic issues relating to the relations between regulators, firms and stakeholders. However, in the conclusions the results of the analysis will be assessed with regard to the different interpretations of ecological modernisation.

3.2.2 The Significance of Regulatory Styles

So what is the relevance of the implementation process to broader programmes of regulatory reform? Previous research has tended to emphasise the significance of new policy instruments, and little emphasis has been placed on the significance of alternative approaches to implementation. However, such issues have not been entirely overlooked. For example, Hawkins (1984) highlighted the potential for regulators to adopt different styles of regulation when he suggested that the implementation and enforcement of environmental regulation could be based either on compulsion, coercion and the imposition of sanctions or on conciliation, compromise and the promotion of compliance.

Similarly, Vogel (1986) studied different approaches to the implementation and enforcement of environmental regulation adopted in the UK and the USA

in the period up to the mid 1980s. This study provides a reference point for much of the subsequent research on the nature and influence of different regulatory styles, partly because the two styles that Vogel describes appear to lie at opposite ends of a spectrum. As Vogel (1986, 21) states:

> *"On balance, the American approach to regulation is the most rigid and rule-oriented to be found in any industrial society, the British the most flexible and informal. The United States makes more extensive use of uniform standards for emissions and environmental quality than does any other nation; the British, with a handful of exceptions, employ neither… The United States makes virtually no use of self-regulation to improve environmental quality; the British rely on it extensively. Regulatory authorities in America take companies to court more frequently than those of any other country; prosecution in Great Britain is rare. The thrust of American environmental regulation has been to restrict administrative discretion as much as possible; in Britain regulatory officials remain relatively insulated from both parliamentary and judicial scrutiny… [However] the most striking difference between the environmental policies of Great Britain and the United States has to do with the relationship between business and government… no other business community is so dissatisfied with its nation's system of environmental controls as the American business community. In Great Britain, by contrast, the relations between the two sectors have been relatively co-operative."*

Despite the notable differences in the approaches to regulation adopted in the UK and the USA, and whilst recognising that it is difficult to make cross-country comparisons of regulatory performance, Vogel (1986, 23) went on to suggest that the environmental outcomes associated with each style of regulation were broadly similar in both countries:

> *"Britain's emphasis on voluntary compliance has not proved any more – or less – effective in achieving its objectives than the more adversarial and legislative approach adopted by policy makers in the United States. American regulatory policy has been more ambitious, but as a result, it has produced greater resistance from business. British regulatory authorities demand less, but because their demands are perceived as reasonable, industry is more likely to comply with them. "*

Since Vogel's study in the 1980s, a variety of authors have drawn upon the concept of regulatory styles in studies of environmental regulation. Some have concluded that such styles are deeply embedded and that they are unresponsive to pressures for change. In the UK, for example, authors such as Allott (1994), Smith (1997) and Skea and Smith (1998) have argued that the flexible, co-operative and compliance-oriented approach described by Vogel in the 1980s survived well into the 1990s despite sustained pressure for change and substantial overhauls of environmental legislation and the institutions associated with its implementation.

More recently, others have suggested that there has been some convergence between the generally cooperative and compliance-based approaches adopted in the UK and other parts of Europe and the adversarial and sanctions-based approaches applied in the US. For example, Loftsetdt and Vogel (2001) argue that in Europe regulators are attempting to win back the trust lost through episodes such as the BSE crisis by adopting more open, arms-length and at times adversarial approaches to implementation and enforcement. In contrast, they suggest that over the years American regulators have won the trust of the public by rigidly enforcing regulatory requirements, but that they are now seeking to respond to the failings of the adversarial system (notably its costliness and its tendency to engender resistance rather than commitment to change) by exploring the potential of more cooperative approaches. Of course such contentions can easily be criticised as, despite early some signs of convergence, the regulatory styles adopted on either side of the Atlantic still have some way to go before they approximate each other. Furthermore, it is doubtful that we can yet talk of a European regulatory style – the approaches adopted in the UK, Sweden, the Netherlands and Germany are very different, and all of these differ substantially from those adopted in southern Europe. Even so, Renn (2001) suggests that in general there have been and will continue to be moves towards what he terms a `mediative' regulatory style based on open and inclusive negotiations between regulators, industry and stakeholder groups.

In what can be seen as a refinement to the debate on national policy styles, others have proposed that it might be possible to combine different regulatory styles in the same setting through the adoption of responsive approaches to regulation. Ayres and Braithwaite (1992) and more recently Gunningham and Grabosky (1999) have called for the adoption of a `pyramid' of different approaches to implementation and enforcement. Such a pyramid of implementation and enforcement would therefore begin by exploiting the benefits of self-regulation. If this did not work, regulators would move on to explore the potential of enforced self-regulation before ultimately resorting to the hierarchical application of command and control regulations. In essence then Ayres and Braithwaite (1992) argue that regulators should cooperate as long as the actors that they are regulating cooperate, but that they should gradually withdraw their cooperation when they encounter non-compliant firms. This presumes that they have the ability to recognise and respond to different levels of compliance.

As stated above, Ayres and Braithwaite (1992) also recognise that attempts to foster such co-operation between regulators and the targets of regulation can lead to regulatory capture. They suggest that while the traditional response to the possibility of corruption and capture has been to introduce measures to limit discretion and to maintain the relational distance between regulators and

regulated, these measures also restrict the potential of regulators to realise the benefits of co-operation. Consequently, they call for the empowerment and wider involvement of public interest groups in the regulatory process so that the benefits of co-operation can still be exploited but in a process that is inclusive, transparent and accountable.

Thus, there is interest in the contribution that different regulatory styles might make in the search for better regulation. Whilst in the past analysts have examined the pros and cons of the regulatory styles that have predominated in different settings, in recent years both theorists and practitioners have started to think about the ways in which different regulatory styles can be brought together within a framework of responsive regulation that allows the best elements of both cooperative and adversarial approaches to be combined. Before moving on to consider the extent to which these debates have influenced regulatory practice in the UK, the discussion will first examine the ways in which certain economic theories of cooperation might help us to develop a fuller understanding of the dynamics that are at the heart of the implementation process.

3.2.3 The Relevance of Economic Theories of Cooperation

While various theories could be drawn upon to analyse the basis for cooperation between different actors, both Axelrod (1984) and Scholz (1984, 1991) apply an essentially economic theory of cooperation to analyse the interactions between regulators and firms. Such an approach emphasises the ways in which the distribution of resources can establish incentives for cooperation between inter-dependent actors. As such this approach relates closely to the policy networks literature where Rhodes and Marsh (1992a, 1992b) and others have argued that actors are drawn into different forms of network through interdependencies relating to resources such as political legitimacy, legal authority, finance, information and organisational assets such as people, skills and understanding.

Economic theories of cooperation have a wide range of applications, however they are particularly relevant in micro-level studies of the implementation process. Whilst making some assumptions that are examined more critically below, Axelrod (1984, 156) describes the interactions that are at the heart of the implementation process in the following way:

> *"The company's choices at any point are to comply voluntarily with the rules or to evade them. The agency's choices are to adopt an enforcement mode in dealing with that particular company which is either flexible or coercive. If the agency enforces with flexibility and the firm complies with the rules, then both the agency and the firm benefit from*

> *mutual co-operation. The agency benefits from the company's compliance, the company benefits from the agency's flexibility. Both sides avoid expensive enforcement and litigation procedures. Society also gains the benefits of full compliance at low cost to the economy. But if the firm evades and the agency uses coercive enforcement, both suffer from the punishing costs of the resultant legalistic relationship. The firm also faces a temptation to evade if the agency is using a flexible enforcement policy that is unlikely to penalise evasion. And the agency faces a temptation to use the strict enforcement mode with a complying company in order to get the benefits of enforcing even unreasonably expensive rules."*

Thus, Axelrod suggests that, where certain preconditions are met[10], resource inter-dependencies will create incentives for regulators and firms to cooperate in order to realise their goals. Consequently, he argues that the interactions between regulators and firms that are at the heart of the implementation process can be depicted in the structure of the following Prisoner's Dilemma (see table 1).

As both the regulators and the firms can choose whether to cooperate or to defect, such a depiction reinforces the view that the implementation process is likely to be based not on the top-down imposition of controls but on a degree of negotiation between inter-dependent actors. This negotiation means that the outcomes of the implementation process are likely to be lower than those that might be achieved if the regulator were able to adopt and maintain a hierarchical, non-co-operative approach. To this extent cooperation represents a degree of regulatory capture. However, adding an important temporal dimension that is often overlooked, Axelrod's (1984) analysis indicates that the short-term optimum for the regulator, namely the top-down imposition of control, simply isn't available as an option in the medium term as firms will react to an agency adopting an uncooperative approach by refusing to cooperate themselves. The

[10] Axelrod (1984) identifies a number of particular preconditions; firstly that co-operation between inter-dependent actors is based on reciprocity, and secondly that what he terms `the shadow of the future' is important enough to make this reciprocity stable. He also assumes that actors are able to recognise and respond to changes in the behaviour of the other actor. Where these preconditions are met, the theory indicates that co-operation is most likely to emerge when the actors adopt a reciprocal strategy based on `tit-for-tat' so that an actor cooperates/defects when the other actor cooperates/defects. When the interactions between the actors are repeated, and where the outcome of future interactions is seen to be important, the theory suggests that interdependent actors will tend towards co-operation. This is the case because with some experimentation and learning, and with ready access to information, it will become apparent that co-operation is in their longer-term mutual interest. Even though there are possibilities for individuals to realise short-term benefits through defection, these will trigger a phase of adversarialism that will be to the disadvantage of each actor. Once established, the theory also suggests that co-operation can become stable and self-policing, particularly where each actor is reluctant to be the first to defect and where each shows a degree of forgiveness towards the defections of the other. In such instances any conflicts that do break out tend to diminish rather than escalate.

same is true for bottom-up capture, where regulators will respond to a firm's lack of cooperation by withdrawing their own cooperation. Each party therefore has to choose between cooperation and adversarialism, and Axelrod (1984) argues that where there are inter-dependencies, where the different actors care about the future and where they are able to recognise and respond to the behaviour of the other, both regulators and firms will choose to cooperate. In essence then the analysis suggests that the co-operative approach represents the second best option in a world where, because of their interdependence, both parties cannot secure their first best option.

Table 1. Regulatory Styles and the Prisoners' Dilemma.

		Regulatory Agency	
		Co-operate	**Defect**
Regulated Firms	**Co-operate**	Cooperation (3,3)	Top-down Control (5,0)
	Defect	Bottom-up Capture (0,5)	Adversarialism (1,1)

(pay-offs for regulators; pay-offs for firms)

1. Top-down control – the regulators secure their objectives through the hierachical imposition of legal authority. Although this option generates the highest pay-offs for the regulatory agency, it is only available temporarily unless firms lack the capacity to influence the behaviour of the regulatory agency.
2. Bottom-up capture – the firms fail to comply with the regulations and the regulators fail to respond. Although this option generates the highest pay-offs for the firms, it is only available temporarily unless regulators lack the capacity to detect and respond to cases of non-compliance.
3. Adversarial relations – firms fail to secure compliance, regulators recognise breaches and respond by adopting a sanctions based approach. Both sides loose out due to higher costs of enforcement/compliance.
4. Co-operative relations – regulators cooperate to promote compliance, firms cooperate to reduce costs of compliance and to avoid the imposition of sanctions. When compared to the pay-odfs associated with adversarialism, both sides benefit from lower costs of enforcement/compliance.

Scholz (1984, 1991) develops Axelrod's theory further by arguing that the beneficiaries of environmental policies, or in other words third party stakeholders, might oppose the emergence of co-operation in the implementation process even if it leads to improved policy outcomes. He suggests that this is because regulatory agencies have to be granted long-term discretionary powers if co-operation is to emerge. As stakeholders may lack trust in the regulatory agency, Scholz (1991, 132) argues that *"the potential gain to beneficiaries from granting necessary discretion to the enforcement agency may be offset by a greater risk that the agency will be captured by business interests"* and that beneficiaries "*may prefer short-term gains to uncertain long-term*

gains that depend on future agency actions". As a result, he argues that "*if beneficiaries always assume that their opponents will soon control the enforcement bureaucracy… it appears unlikely that they would ever trust the bureaucracy with the long-term discretion required for effective (co-operative) enforcement"*.

This is an important point as it indicates that the potential for cooperation depends not only on the relationship between regulators and regulated firms but also on the interests and influence of third parties. If cooperation is to persist, stakeholders must either trust the regulatory agency enough to allow it to exercise discretion in the implementation process, or have such limited influence that they are unable to disrupt cooperative approaches when they emerge. As the effective exclusion of stakeholders from influence is increasingly untenable, particularly where laws have established rights to access information and to participate in decision-making, stakeholder trust effectively becomes a pre-requisite for cooperation in the implementation process.

By examining the relevance of these economic theories of cooperation to the policy process we have seen that the two most commonly discussed outcomes – top-down control or bottom-up capture – may not be available as options in the medium term. Instead, the effective choice for regulators and firms that interact over a sustained period of time is either to fight or to cooperate. If left to their own devices, Axelrod's theory suggests that they will cooperate where certain preconditions are met. However, by expanding the analysis to consider the role of third parties, Scholz suggests that in order to do so they must either be trusted by stakeholders or insulated against the influence of suspicious stakeholders. The section below examines the extent to which these theoretical perspectives help to explain the origins and influence of cooperative regulatory styles in the UK. Before moving on to the empirical debate, however, the paper will first consider the strengths and weaknesses of such an economic approach to the study of the implementation process.

3.3 The Empirical Study

Given the focus on the incentives for cooperation between actors at the micro-level, an economic approach reflecting aspects of rational choice theory would appear to provide an appropriate framework for empirical analysis. However, such an approach can be criticised for not placing enough emphasis on the role of institutions. A number of institutional dimensions are apparent – for example, interactions in the implementation process do not take place in a vacuum, instead the institutional context shapes resource allocations and defines the rules of the game. Furthermore, resource allocations and incentive structures

are not exogenously defined or insulated from external influence – behaviour both shapes and is shaped by institutional context. Finally, some forms of behaviour are likely to emerge, evolve and become institutionalised - particularly where cooperation generates trust and mutual understanding, or in other words social capital, which reduces the costs and increases the benefits of further cooperation in the future (see Ostrom – Schroeder – Wynne 1993 or Rydin – Pennington 2000). This suggests that `co-operative regulatory spaces' may not simply exist but that they can be created and shaped by the co-evolution of the institutions and incentives that provide the basis for such co-operation. This makes it more difficult to draw insights from or to contribute to a generic theory of cooperation, as interactions are likely to be shaped by factors that are specific to a time and a place. However, within specific contexts, it also means that the explanatory value of approaches, which combine economic and institutional dimensions, is likely to be greater than those that rely on economic perspectives alone.

On the basis of such an approach, the questions for an empirical study on the origins and influence of cooperation in the implementation process can be divided into five main categories:

- What is the institutional context within which the various actors exist and interact and how does it shape the resources that they have access to?
- What resources do the different actors draw upon as they seek to exert influence in the implementation process?
- Are there any resource inter-dependencies in the implementation process and how do these influence the incentive structures faced by the different actors?
- How have these incentive structures and any associated forms of behaviour evolved over time and how are they affected by third parties?
- What is the impact of these factors on the overall regulatory style and how does this style affect different measures and perceptions of regulatory performance?

The empirical analysis below addresses these questions by focusing on the implementation and impact of the framework of Integrated Pollution Control (IPC) regulations, which has been in place in England and Wales since 1990. IPC regulations oblige approximately 2000 of the largest and most environmentally significant industrial processes to prevent, minimise and render harmless emissions of prescribed substances, to meet emissions limits that are compatible with the best available techniques not entailing excessive cost (BATNEEC) and to channel any remaining emissions to the best practicable environmental option (BPEO - meaning air, water or land). As these regula-

tions also formed the basis for the EU's Integrated Pollution Prevention and Control (IPPC) Directive, aspects of the analysis are of relevance across the EU member states and the accession countries.

The empirical study focuses on the micro-level interactions between inspectors in the regulatory agency who are charged with interpreting, applying and enforcing the regulations and the managers of the regulated firms that must comply with the regulations. It also considers the influence and perspectives of third party stakeholders at both the local and national levels. The inspectors interviewed worked within the Environment Agency for England and Wales; the managers were typically the health, safety and environment managers of the large industrial processes in a variety of the sectors that are regulated by IPC. The stakeholders interviewed were representatives of local-level community groups and national level pressure groups, each with an active interest in the performance of the IPC regulations. To eliminate any regional disparities, all interviews were conducted in the northeast of England.

The empirical data upon which the analysis is based was collected through a series of semi-structured interviews conducted in two phases: the first in 1996/7, the second in 2001/2. In the first phase, six interviews were conducted with inspectors in the implementing agency and fifteen with the managers of regulated firms. The data collected was updated in the second phase through two more interviews with inspectors in the regulatory agency and five more with the managers of regulated firms. The data was also expanded to include stakeholder perspectives through three interviews conducted in 2002. All interviews sought to explore the various actors' perspectives on the research questions outlined above. The results of the interviews were analysed with reference to the key variables associated with these questions, namely those relating to institutional context, the character and resources of the different actors, the extent of any inter-dependencies and any associated incentives for cooperation, the ways in which any such incentives had influenced behaviour over time and the impact of such behaviour on different perceptions of regulatory performance.

3.4 Results and Analysis – Evolving Regulatory Styles and the Implementation of IPC

3.4.1 Institutional Context

Prior to the inception of the IPC regulations, a cooperative and hands-on approach to implementation had predominated in England and Wales for many years. Whether this reflects the British culture more broadly or merely the

pragmatism of the Alkali Acts in 1860s[11] is difficult to say. However, it is clear that some social capital had been carried over from the previous legislation in the form of an implementation process that was based upon the presence of relatively close, trusting, reciprocal relationships between the inspectors and the managers of the regulated sites. Such an approach was seen by both regulators and firms to have some benefits as it was seen to enhance the efficacy of the regulations and to reduce the costs of compliance (see below). However, at various times concerns had been expressed both within the regulatory agency and amongst stakeholder groups about the accountability of this approach to implementation. The regulatory agency was also concerned because, with approximately 200 expert inspectors and slightly more than 2000 processes to regulate, it was seen to be a resource intensive approach to implementation.

For a short period in the early 1990s, the regulatory agency sought to respond to these concerns by adopting a less cooperative and more arms length approach to the implementation of IPC. However, the companies responded by withdrawing their own cooperation and by raising the prospect of mass inactivity and/or non-compliance. As the regulatory agency was unwilling or unable to force the regulated firms to take steps to work towards compliance, and as external stakeholders lacked the ability to force change, the brief experiment with an alternative approach to implementation failed and cooperative relations quickly re-emerged. Support for the cooperative approach then evolved amongst the inspectors and the managers and the approach became further embedded as each adopted `tit-for-tat' strategies that rewarded cooperation and sanctioned defection.

However, the cooperative approach to implementation was not only determined by historical precedent and institutionalised modes of behaviour – it also depended upon a number of other contextual factors. The first of these related to the design of the regulations themselves – and particularly to the fact that the regulations are based on two flexible regulatory principles (BAT-NEEC and BPEO) that need to be interpreted, applied and enforced on a case-by-case basis. In the early stages of the IPC regime, process specific guidance notes were formulated at a higher level – and hence there were opportunities for government, regulators and industry to influence the standards to be applied during the implementation process. However, the guidance given to inspectors on how to interpret these principles was seen as little more than a useful reference document, and the related enforcement procedures were also open to interpretation. This gave the inspectors a considerable amount of dis-

[11] By obliging industrial sites to adopt the `best practicable means' for pollution control, these early environmental regulations sought to balance the need for environmental improvement with concerns about the costs of compliance. Flexibility and room for negotation were therefore built into the regulatory system from the outset.

cretionary power in the way they interpreted, applied and enforced the regulations. However, the inspectors also depended upon the firms that they were regulating for the information they needed to interpret and apply these principles. As a result, there were incentives for both sides to cooperate. As experience with the regulations evolved and precedents were set, and as the Environment Agency matured and established clearer enforcement policies, the significance of these discretionary elements and information asymmetries diminished, and as a result so did the incentives for cooperation.

A second factor, which created a basis for cooperation, was related to the amount of time and expertise that the regulatory agency dedicated to the implementation process. During the first five years of IPC, the resources available to the regulatory agency – then Her Majesty's Inspectorate of Pollution (HMIP) – allowed expert inspectors to adopt a close working relationship with the firms that they regulated, often over a prolonged period of time. This level of resourcing – which for a time was maintained when HMIP became part of the larger Environment Agency (EA) in 1995 – enabled trust and mutual understanding to develop in the implementation process. This was an important precondition for cooperation. It also enabled inspectors to transfer information and understanding to cooperative firms, thereby helping them to work towards more effective and efficient forms of compliance and to recognise and respond to firms that were not working towards compliance. However, the creation of the EA also led to this level of resourcing coming into question. Expert inspectors with industrial experience were expensive, and adopting close working relationships with firms meant that a lot of inspectors were needed to regulate a relatively small number of industrial processes. As inspectors left, they were often replaced by new recruits who lacked such experience. These inspectors were less able or willing to cooperate in the same ways as the more experienced inspectors and as a result they tended to implement the regulations more formalistically. Again therefore the opportunities for cooperation diminished over time.

A third factor, which enabled cooperation in the implementation process, was the availability of economically acceptable improvement options in many of the regulated firms. Aided by the information and understanding made available by the inspectors, during the early stages of IPC many of the regulated firms were able to find a large number of low-tech and low-cost ways of improving their environmental performance. These approaches to compliance were initially seen by the managers of the firms to be more risky and disruptive, and they required managerial effort over a sustained period of time. However, many of the changes made had a positive impact on energy and materials efficiency. This did not necessarily mean that the regulations led to outcomes that were beneficial both economically and environmentally, indeed

for some sectors low-cost forms of compliance were simply not available. However, it did mean that the costs of compliance were not as great as many of the managers of the firms had first thought. As a result the managers were happier to cooperate with the inspectors and to comply with the regulations. However, as the easier options were exploited, so the costs of further improvement began to escalate and once more the basis for cooperation began to be eroded. This was exaggerated by a slow-down in the UK manufacturing sector in the late 1990s.

A final factor that influenced the basis for cooperation in the implementation process related to the role of stakeholders. In the mid-1990s, stakeholders were unable either to participate in the implementation process or to scrutinise its impacts on the emissions from regulated sites. Although technically they could read any official correspondence and examine emissions data in the public registers that were held at various EA offices, practically this information was inaccessible to all but the most dedicated and well-informed stakeholders. However, in the late 1990s, the EA established what is now its on-line pollution inventory, which enabled stakeholders with access to the Internet to type in their postcode and get a map of their area showing all regulated sites. By clicking on the symbol for each site they could then get a full list of emissions and information on the impacts of these on health and the environment. Although local stakeholders still find this database quite inaccessible, national pressure groups have `simplified and amplified' the information contained within it, for example by publishing league tables of the `top ten cancer factories' in England and Wales. All of these factors have meant that the regulators have become more aware of issues relating to legitimacy and accountability in recent years. This and the prospect of new legislation that will further empower stakeholders[12] has encouraged the EA to formalise their regulatory processes, to work towards greater transparency in all of their operations and to begin to develop closer links with different stakeholders, most notably local community groups. All of these initiatives have started to have an impact on the basis for cooperation in the implementation process.

It is apparent therefore that a range of institutional factors – many of which are specific to a particular time and place – have influenced the basis for cooperation in the implementation process. As the discussion that follows shows, these changes in institutional context clearly had an influence on the nature of the interactions between regulators and firms.

[12] Significantly, stakeholders at all levels will be further empowered in the coming years as the Aarhus Convention comes into force as it creates rights to access information and to participate in decision making processes – including those at the heart of the implementation process. Should these rights be curtailed, the convention establishes rights to justice.

3.4.2 Resources, Inter-dependencies and the Incentives for Cooperation

The broader institutional context outlined above helped to define the resources that the regulators and the managers of regulated firms could draw upon as they sought to exert influence in the implementation process. For the regulators, legal authority was an important resource as it gave them the power to issue and enforce permits. However, as in the mid-1990s inspectors were keener to promote compliance than to sanction non-compliance, legal authority was generally applied only as a last resort - indeed, some inspectors felt that the need to resort legal action was a sign of their own failure to engage with the companies to ensure that they complied with the regulations proactively. As a result, the practicalities of regulation took place in what can be termed the `shadow of hierarchy' – legal authority could be applied where absolutely necessary, but at least in the mid-1990s, it was not a resource that was commonly deployed.

By the late 1990s, the EA had formalised its approach to enforcement and by 2002 there were signs that it was starting to apply legal sanctions more readily. For instance, the EA formally adopted a tiered-approach to enforcement that characterised different types of offences and set out the enforcement activities that would be triggered by each type of offence. As well as lobbying for the application of higher fines for more serious offences, the EA also developed its own capacity to reward good performers and to sanction bad performers. It did this by starting to publish information on the environmental performance of the regulated sites through its on-line pollution inventory, and by publishing media friendly reports which `named and shamed' the worst non-compliers. As companies appeared to be more concerned about the damage to their reputation than the level of the fines imposed by the courts, the ability of the EA to delegitimize firms in the eyes of their stakeholders became a significant resource towards the end of the 1990s.

Although these developments were significant, on a day-to-day basis the inspectors continued to be more concerned with promoting compliance than with sanctioning non-compliance. In the mid-1990s, discretionary powers were an important resource because of the flexibility of the principles upon which IPC is based and the absence of meaningful guidance. However, the EA soon developed more explicit criteria to govern the implementation process. For example, it developed the Operator and Pollution Risk Assessment (OPRA) scheme, which ranks both the pollution hazard and operator performance of individual sites on a scale of A-E according to a standardised set of criteria and methodology. This scheme sought to promote consistency and to enable the inspectors to focus their attentions on the highest risks or worst performers. While such schemes had an effect on the implementation process, the

inspectors retained some discretionary powers as they still had to interpret and apply the regulations and the guidance and to establish priorities on the ground. Although in theory the firms had the ability to challenge the decisions of the inspectors, they rarely did so formally, preferring instead to negotiate with the inspectors and to maintain cooperative relations wherever possible. An ability to exercise discretion therefore continued to be an important resource for the inspectors in the implementation process.

Once site-specific standards had been established, the inspectors were able to work with the more cooperative companies as they explored the potential of different approaches to environmental improvement. By developing a close working relationship with such firms, and by transferring information and understanding between firms, the inspectors were able to work with the managers to build capacities for compliance. By offering some flexibility regarding the times by which particular standards had to be achieved, they also enabled firms that demonstrated a commitment to compliance to experiment with alternative approaches, safe in the knowledge that they would not immediately find themselves in court if their initiatives did not work. Thus, the insight and understanding of the inspectors became an important resource, as did the flexibility they were able to offer to cooperative firms that demonstrated some commitment to compliance. However, concerns about the cost of employing inspectors with industrial experience meant that by the late 1990s the EA had started to employ less expert inspectors and hence the significance of this resource had started to diminish.

As the cooperative approach to implementation was thought to have led to the adoption of more effective and more efficient approaches to environmental improvement, both the inspectors and the managers believed that it had reduced the costs of compliance. Indeed, in many instances in the mid-1990s the inspectors were able to argue that compliance could often be secured in economically acceptable ways – this became an important rhetorical resource, which was used to counter the claims that managers sometimes made about excessive costs of compliance. However, by 2002 many of the managers felt that the easy options for environmental improvement had started to dry up and that further demands for environmental improvement would require more radical changes to be made which would be much more expensive to implement. As a result, the rhetorical resource that had been available to the inspectors a few years earlier had become much less significant.

For their part, the firms were able to decide whether or not to grant the inspectors easy access to the site-specific information that they needed to apply the regulations. This was a particularly important resource in the early to mid 1990s when standards were being interpreted and permits issued and when reliable monitoring frameworks were still being developed. However, as

the regulations became better established, and as more reliable monitoring technologies gave the inspectors better access to data, so the inspectors' need for information diminished. Even so, the firms still had the ability to develop and draw upon commitments to compliance and to allocate the financial and managerial resources and the risk management capacities that were needed if the potential of new technologies and techniques was to be explored. Such commitments and capacities were of value to the inspectors as they made it easier to implement the regulations and to secure the environmental improvements that were being sought. Where such resources were withheld, the inspectors had to resort to the application of informal and then formal sanctions. As well as being expensive for the EA itself, this was seen to represent something of a failure on behalf of the inspectors. Thus, firms had the ability to influence the costs and the reputation of the inspectors and of the regulatory agency.

More broadly, firms had the ability to influence the reputation of the regulators by lobbying government, notably through trade associations. By claiming that the regulations were unnecessary or too expensive and that the regulators were making unreasonable claims, they could argue that the powers of the EA should be curtailed and its funding cut. Despite this potential, there was not much evidence that the firms themselves had engaged in such activities, although organisations such as the Confederation of British Industry or the Chemical Industries Association regularly made such claims on their members' behalf.

Thus, both the regulators and the firms had resources that they could choose how to deploy in the implementation process, and as each depended on the resources held by the other, there were incentives for each to cooperate with the other. Over time, the significance of some of these resources had diminished, and hence the incentives for cooperation had been reduced. With this in mind, the next section considers the ways in which the strategies adopted by the different actors evolved over time and the extent to which these changes influenced the ways in which the different actors viewed the performance of the regulations and the associated implementation process.

3.4.3 Evolutions in Regulatory Styles and Perspectives on Performance

Given the nature of the interdependencies and the associated incentives for cooperation that were present in the mid-1990s, the interactions between regulators and firms can be depicted in a similar manner to that proposed by Axelrod (1984). Table 2 shows the phased evolution of the cooperative regulatory style associated with IPC in the early to mid 1990s. Each phase in the

evolution of the regulatory style is given a number and a position in the grid, which reflects the decision of both the regulators and the firms to cooperate or to defect.

Table 2. The Evolution of the Cooperation Approach to the Implementation of IPC in the early to mid-1990s.

		Regulatory Agency	
		Co-operate	**Defect**
Regulated Firms	**Co-operate**	1, 5, 9	2, 8
	Defect	4, 6	3, 7

Phase

1. Initial position upon inception of IPC regulations; cooperative approach to pollution control.
2. Regulator's brief attempt to adopt a more arms-length approach in the early days of IPC.
3. Firms' reaction to withdrawal of regulator's cooperation results in brief period of mutual defection.
4. Regulator responds to prospect of mass non-compliance by initiating the restoration of cooperative relations.
5. Firms respond by cooperating and working towards compliance.
6. Occasional breaches of compliance occur.
7. Occasional breaches are recognised by the inspectors, who respond by withdrawing their cooperation.
8. Because firms value the cooperation of the agency, they tend to come back to compliance.
9. Forgiving regulators respond and cooperative relations are gradually restored.

As is depicted in Table 2, IPC was first implemented in a context where a cooperative regulatory style had been prevalent for many years (Phase 1). Although in the early 1990s the regulatory agency attempted to break away from this precedent (Phase 2), the regulated firms were able to withhold their resources (Phase 3). In order to meet deadlines for the operationalisation of the regulations the agency reinstated its cooperation (Phase 4), the firms then responded and a cooperative approach re-emerged (Phase 5). If anything, support for the cooperative approach then increased in the mid-1990s, and if either actor tried to break away they could only do so temporarily as the other actor could also defect and as the cooperative approach was seen by both parties to be better than one based on sustained adversarialism. Thus, where firms fell out of compliance (Phase 6), this was recognised by the regulators who responded by withdrawing their cooperation (Phase 7). As their cooperation was valued by the regulated firms, and because an adversarial approach was not in their interests, the firms tended to come back into compliance (Phase 8) and once they had done so the forgiving regulators restored their cooperative approach (Phase 9). Thus, as Axelrod (1984) predicted, where there are

resource inter-dependencies, and where certain preconditions are met, cooperation can be the stable outcome and therefore the prevalent regulatory style.

From the perspective of the regulators and the firms, the cooperative approach to implementation that was prevalent in the mid-1990s was seen to be effective as it led to the uptake of technologies and techniques that better enabled the regulated firms to anticipate and avoid their emissions. While this approach to implementation that was prevalent in the mid-1990s was seen to be effective as it led to the uptake of technologies and techniques that better enabled the regulated firms to anticipate and avoid their emissions. While this approach to implementation was expensive for the EA to maintain, the firms thought it was efficient as it enabled them to reduce the costs of compliance. However, the close, cooperative relations between the regulators and the managers of the regulated firms were viewed with suspicion by third party stakeholders. These suspicions were aggravated by the fact that stakeholders were unable either to participate in the process or to scrutinise its outcomes. As a result, they perceived both the actors and the process itself to be completely unaccountable. Even though the implementing agency had at one point attempted to respond to their concerns, as attempts to move away from the cooperative approach had failed, stakeholders felt that they had been unable to have a significant influence on the nature of the implementation process. This reinforced their view that the standards were being watered down during the implementation process and that they were inadequately enforced. In other words stakeholders tended to believe that the regulatory agency had been captured by the companies that it regulated.

As the discussion above indicates, many of the factors underpinning the cooperative approach to implementation began to change in the late 1990s. Furthermore, as the broader context for regulation changed and as the Environment Agency developed, regulation was increasingly required to be not only effective and efficient but also to be proportionate, consistent, transparent and accountable. Thus, the EA had to grapple with the question of how best to meet all of these different measures of regulatory performance whilst recognising that the practicalities of the implementation process continued to be shaped by resource inter-dependencies of the type outlined above.

In recent years, the EA has responded to such questions by developing a responsive or risk-based approach to implementation and enforcement, which focuses regulatory resources on the highest risks or worst performers. In this way, cooperative and compliant firms can be regulated with a lighter touch and non-compliant firms can be punished by applying sanctions more forcefully but also more proportionately. Minor breaches should meet with informal sanctions such as the withdrawal of cooperation, more serious or sustained breaches with a formal warning and major incidents or recurrent non-compli-

ance with legal action and other measures designed to influence the reputation or perceived legitimacy of the firms. By formalising the basis for such an approach, by making the factors which shape the decision-making process much more transparent and by publishing information on environmental outcomes, the EA has also attempted to make the implementation process more accountable.

These developments have changed the dynamics of the relationship between regulators and firms. By adopting such a tiered approach, the EA has recognised a wider range of options for either actor - regulators can be more or less interventionist, firms can be more or less compliant. As resource inter-dependencies still exert an influence, both regulators and firms continue to be drawn away from approaches, which are in their own interests but against those of the other. As a result, both continue to be drawn back towards cooperation and compliance. However, as the interdependencies are not as strong as they were, cooperation is not as much of a necessity and a more adversarial approach can be sustained for a longer period, particularly where the EA focuses its resources on the worst performers or the highest risks.

This approach doesn't fit neatly into the simple cooperate-defect model outlined above. However, because resource inter-dependencies continue to shape the interactions between regulators and business, the dynamics of the model are still relevant even if the range of available options has expanded. The model of regulatory interactions presented in Figure 1 recognises these factors.

Within the figure, darker squares relate to the more serious defections which either trigger more forceful sanctions from regulators or more serious complaints and appeals from industry while the lighter squares relate to less serious defections. In either instance, there are incentives for firms and regulators to come back to a different point on the tiered approach to implementation and enforcement. Once they are there, there are incentives for both to move towards a cooperative approach with less interventionist regulators and more compliant firms.

Although the approach to implementation depicted in figure 1 is still evolving, it is a more accurate depiction of the regulatory style that has emerged in the last few years than the simpler approach applied in the early to mid-1990s and outlined in Table 2.

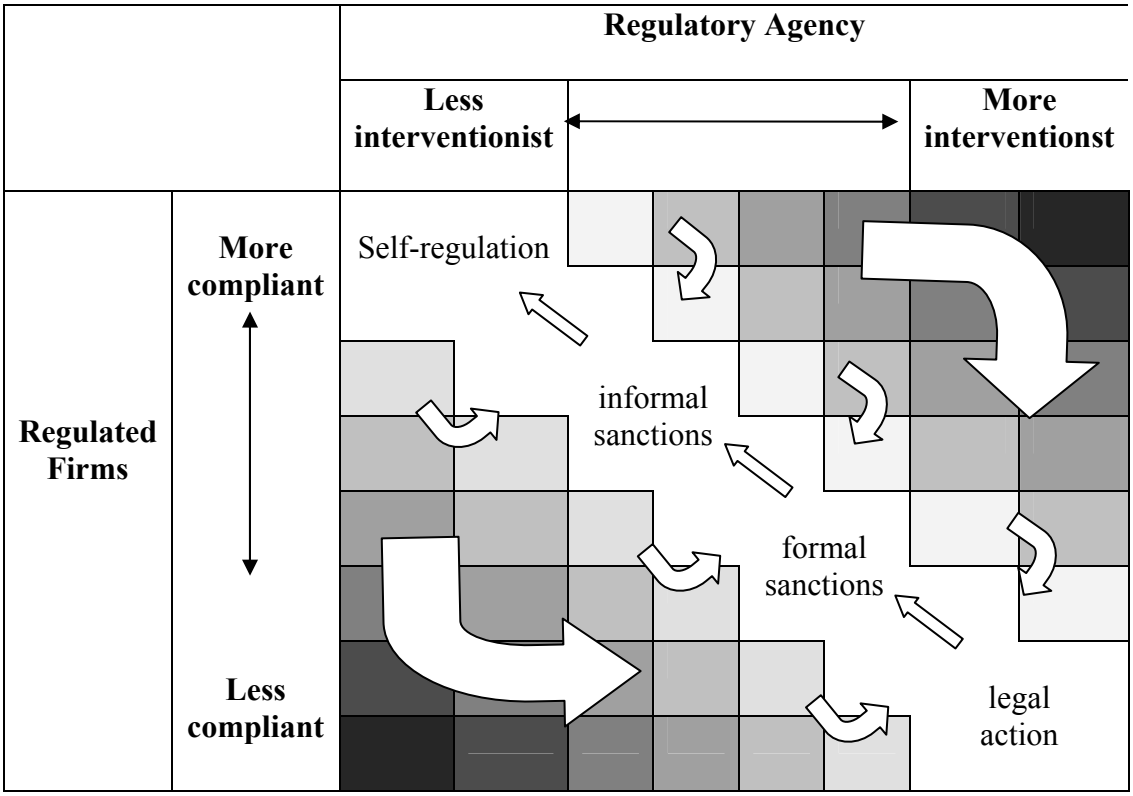


Figure 1. The Dynamics of a Responsive, Compliance Based Regulatory Style.

In relation to its influence on outcomes, the regulatory style that has emerged in recent years is seen by the regulators to have a number of benefits, particularly because it enables them to retain the benefits of cooperating with firms that show some commitment to and a capacity for compliance. It also allows them to use their resources in a more targeted way by adopting a `worst-first' or `risk based' approach. By formalising and publicising the ways in which judgements are made and priorities are set, they have also been able to make the decision making process more transparent and the decision makers more accountable. However, the regulators have sometimes struggled to formalise the basis for such approaches – the OPRA scheme described above took years to develop, and it continues to depend upon inspectors making subjective judgments when ranking sites according to a range of criteria. There are also questions about the extent to which the rankings that it provides can be relied upon by the inspectors and whether such a formalised system can replace the intuition and insight that comes from years of experience. Finally, if a site with a low risk rating was regulated with a lighter touch and was then involved in a major incident, there are concerns that the reputation of the EA might be affected and that it might even become liable in some way.

The emergence of such an approach to implementation has been given a mixed reception by the managers of the regulated firms. As most see them-

selves as being cooperative and compliant, they are looking forward to being regulated with a lighter touch. However, they felt that such an approach had yet to be adopted and have called for greater `regulatory relief' to be given, particularly where they have a certified environmental management system in place. As yet the regulators have been reluctant to do this (see Wätzold et al 2000; Dahlström et al 2003). Although some managers welcomed the emergence of a more consistent and predictable approach, others argued that a `one size fits all' approach might eventually emerge that will impose higher costs of compliance than a more flexible approach. Finally, many managers argued that the application of a sanctions-based approach would be counter-productive as it engendered resistance and discourage them from exploring the potential of new technologies and techniques.

Despite these changes, stakeholders continued to view the implementation process with suspicion. In part, this is because the EA has struggled to communicate with its stakeholders - particularly those at the local level. Although committed and well-informed stakeholders can find out more about the factors that guide the regulatory decision making process than they have ever been able to in the past, in practical terms the information that has been made available has had a limited impact. Much of the information is immediately dismissed by the stakeholders because they don't trust the source and because they expect it to be too technical and complex to be of value. It is also because the information that is provided fails to meet the demands of many stakeholders in some key respects. For example, as data is provided for each regulated process individually, it doesn't allow stakeholders living in areas where there are a number of regulated processes to make judgements about collective impacts on local environmental quality. Furthermore, as information on emissions from each regulated process is only available as a yearly aggregate, stakeholders can't find out about emissions during particular periods. Finally, it also doesn't include information on any incidents or on the ways in which the EA has responded to them. As yet, provisions for extra transparency have had only a limited effect on the perceptions of stakeholders who argue that there needs to be much more engagement and meaningful dialogue before confidence in the EA and its activities can be built.

3.5 Discussion

Within the context of broader debates on regulation and its reform, this paper set out to examine the factors that shape the origins and influence of cooperative regulatory styles. By adopting an approach, which recognises the influence of both institutional and economic factors at the micro-level, it proposed

that under certain circumstances resource inter-dependencies could create incentives for cooperation in the implementation process.

The empirical analysis of the regulatory styles associated with the implementation of IPC in the early to mid 1990s supported this proposal in a number of ways. First, it highlighted the importance of a number of institutional factors - historical precedent, regulatory design, the presence of particular technological opportunities within the regulated firms and the effective exclusion of suspicious stakeholders were all important factors which underpinned the cooperative approach. Second, it found that both the regulators and the firms drew upon a range of resources as they sought to exert influence in the implementation process. As both had access to important resources, incentives for cooperation emerged. Third, it found that the cooperative approach that emerged as a response to these incentives was quite resilient. Whenever the regulator sought to respond to stakeholder concerns by adopting a more arms-length approach, the firms withdrew their own cooperation, effective implementation became impossible and the cooperative regulatory style quickly re-emerged. As Table 2 illustrates, Axelrod's (1984) model clearly contributes to a fuller understanding of the dynamics of the regulatory style was maintained in the early to mid 1990s.

In terms of its influence, this cooperative regulatory style generated outcomes that both the regulators and the firms perceived to be effective and efficient, not least because it was seen to have effectively promoted the development and diffusion of new technologies, although it is important to note that it had done this through capacity building rather than technology forcing. The regulators and the firms therefore emphasised the view that cooperation facilitated collective action. However, this approach also failed to win the confidence of external stakeholders who commonly associated the cooperative approach with regulatory capture. Tensions between what Hutter (1997) terms the consensual theorists on the inside (i.e. regulators and firms) who emphasised the role that cooperation played in facilitating collective action and the conflict theorists on the outside (i.e. stakeholders) who focused on the loss of accountability and the potential for regulatory capture were significant therefore. Just as Scholz (1984, 1991) suggested, if the conflict theorists had had more influence, they might have been able to disrupt the cooperative approach.

Although the empirical cases fitted neatly with the theory in the period to the mid-1990s, by the early 2000s the practice had evolved quite considerably. While the cooperative approach was still the preferred option for the inspectors and the firms, the context for its application had changed. As is exemplified by the Royal Commission on Environmental Pollution's (1998) report on environmental standard setting, in the UK at this time there was considerable

interest in the potential of more open and inclusive approaches to decision making. The Environment Agency responded to this broader debate by starting to adopt initiatives, which sought to improve transparency, encourage engagement and enhance accountability. These early changes in culture were reinforced by certain legal requirements to provide access to information. At the same time the incentives for cooperation with regulated firms were diminishing, for example as discretionary powers were curtailed, as economically acceptable forms of compliance became less prevalent and as the inspectors came to depend less on the information that was held by the managers of the regulated firms. Even so, some incentives for cooperation remained and hence the economic model outlined above continued to offer some explanatory value.

Collectively, these changes meant that a different approach emerged which was akin to the responsive regulation concept proposed by Ayres and Braithwaite (1992). This approach, which is depicted in Table 3, sought to maintain the benefits of cooperation but to build the capacity of the regulators to apply a range of sanctions when a compliance-based approach wasn't working. By recognising a wider range of options, and by formalising the factors that would lead the regulator to switch from one tier to another, the regulatory style also became more transparent and accountable. This can be seen as a clear attempt to combine the positive aspects of different regulatory styles as the regulator sought to create an approach to implementation that allowed it to continue to exploit the benefits of cooperation (i.e. collective action) when it encountered a compliant firm whilst avoiding the pitfalls of such an approach (i.e. regulatory capture) when it encountered a non-compliant firm.

As such, this approach sought to appeal both to the conflict theorists and the consensual theorists identified by Hutter (1997). However, it has yet to build stakeholder confidence in the regulatory decision making process. There appear to be two main reasons for this. The first is that the regulatory agency hasn't been able to communicate effectively with its stakeholders about the changes it has adopted. The second is that even where it has communicated the changes have often been ignored or dismissed by suspicious stakeholders. Indeed, it may be that the mistrust amongst stakeholders may be so embedded that it may take years to change, especially if it relates to not only to the regulatory process itself but to the close, cooperative relationships between government and industry that prevail more generally. If this is the case, then there may need to be a much more fundamental change in the nature of these relationships before public confidence in regulatory agencies can increase substantially.

The continued absence of stakeholder trust may become a more significant issue in years to come as stakeholders are given new rights to access informa-

tion, to participate in decision-making and to seek access to justice by the inception of the Aarhus Convention. These new rights will enable NGOs to challenge the basis for any decisions that they don't like in court, and potentially to force the regulators to adopt a more arms-length and adversarial approach. If they choose to do this then the pendulum will have swung from the one side to the other, as the UK's regulatory style will come to resemble that of the US. However, with some trust amongst the different actors it may be that best of both worlds can be maintained. If so, the new regulatory style that has emerged in recent years will represent a very British compromise.

3.6 Conclusions

Within the context of broader debates on regulation and its reform, this paper set out to examine the factors, which shape the origins and influence of cooperative regulatory styles. The most important conclusions from the analysis relate to the explanatory value of the theoretical approach, the nature of the evolutions in regulatory style that have been documented by adopting such an approach and the implications of such evolutions for practical debates on regulation and its reform and for broader conceptual debates on institutional learning and ecological modernisation.

In relation to the first of these points, the empirical analysis has shown that the economic theory of cooperation proposed by Axelrod (1984) certainly has some explanatory value. By highlighting the role that certain resources play in the implementation process, and by emphasising the significance of various resource inter-dependencies, the empirical analysis was able to explain the dynamics of regulatory behaviour and the evolution of regulatory styles in the period between 1995/6 and 2001/2. However, throughout this paper it has been argued that such an economic approach overlooks some critically important institutional dimensions. In part, these relate to the role that the broader institutional context plays in defining the resource allocations and hence the incentive structures that in turn influence the strategies that the different actors adopt in the implementation process. Perhaps more notably, they also relate to the ways in which the broader institutional context facilitates or enables particular forms of behaviour. Indeed, Scholz's (1984 1991) claim that cooperative regulatory styles depend either upon the presence of trusting stakeholders or on the effective exclusion of suspicious stakeholders was entirely supported by the empirical analysis. Thus, we can conclude that the explanatory value of an approach which is sensitive to issues of context and which considers both institutional and economic factors is likely to be greater

than one which treats these factors as exogenous and which focuses on economic factors alone.

By adopting an approach, which combined institutional and economic aspects, the paper has documented the dynamics of regulator-industry-stakeholder relations in one sphere of public policy in the UK two discrete periods. In so doing it has highlighted some important evolutions in the regulatory style associated with the implementation of environmental regulations in the UK. Although the empirical analysis emphasised the resilience of the cooperative regulatory style in the period to the mid-1990s, it found that the regulatory style had started to change in the years since as the incentives for cooperation diminished and as the regulatory agency started to respond to stakeholder concerns. The regulatory style that has emerged reflects aspects of the `responsive' approach proposed by Ayres and Braithwaite (1992) and discussed by Gunningham and Grabosky (1999). By adopting such an approach, and by making the criteria that guide the regulatory decision making process more transparent and by publishing information on environmental outcomes, we can conclude that the regulators have been trying to resolve the tensions between those who are primarily concerned with the efficacy and efficiency of regulatory outcomes and those who are more concerned with the transparency and accountability of regulatory decision making processes.

Although they may reflect the idiosyncrasies of the UK, these findings are of clearly of wider relevance. For those countries in the EU that have tended to adopt a cooperative approach to implementation, they provide some insight into how the benefits of a cooperative approach can continue to be exploited but within a more transparent and accountable context, whilst for the US they give some clues as to how accountability can be maintained whilst moving towards a more cooperative approach. Perhaps more significantly the findings document a process of institutional learning, with a regulatory agency responding to the conflicting pressures that it has been put under by developing a new approach to implementation. Of course this approach has involved compromise and trade-offs still have to be made between different priorities. However, the tensions between those conflict theorists who equate cooperation with regulatory capture and those consensus theorists who see it as a way or enabling collective action have undoubtedly been reduced to some degree by the evolutions in regulatory style that this paper has documented.

Finally, it is apparent that although the paper has focused on the practicalities of regulation at the micro-scale, its findings can also contribute to broader conceptual debates on ecological modernisation. Most notably, the analysis has illuminated some of the ways in which social learning can take place; when faced with a crisis of confidence in the regulatory process, the paper has suggested that the institutional context for regulation can change and that new

approaches to implementation can emerge which reduce some of the tensions between regulators, industry and stakeholder groups. Of course, such changes may not fundamentally alter the course of capitalistic development in late-modern industrial societies, but they do demonstrate a degree of reflexivity within those societies.

References

Allott, K. (1994) *Integrated Pollution Control: The First Three Years*. Environmental Data Services: London.

Axelrod, R (1984) *The Evolution of Cooperation*. Basic Books: New York.

Axelrod, R. (1997) *The Complexity of Cooperation.* Princeton University Press: Princeton.

Ayres, R. – Braithwaite, J. (1992) *Responsive Regulation: Transcending the De-regulation Debate*. Oxford University Press: Oxford.

Baldwin, R. – Scott, C. – Hood, C. (1998) *A Reader on Regulation*. Oxford University Press: Oxford.

Dahlström, K. – Howes, C. – Leinster, P. – Skea, J. (2003) Environmental management systems and company performance: assessing the case for extending risk-based regulation. *European Environment,* 13 (4): 187–203.

FoE (2002) Big Cuts in Cancer Gases Achieved. *Press Release*, 6 March. Friends of the Earth: London.

Glasbergen, P. (ed.) (1998) *Cooperative Environmental Governance*. Kluwer: Dordrecht.

Gouldson, A. – Murphy, J. (1996) Ecological Modernisation and the European Union. *Geoforum*, 27 (1): 11–22.

Gouldson, A. – Murphy, J. (1997) Ecological Modernisation: Restructuring Industrial Economies. In: *Greening the Millennium: The New Politics of the Environment,* ed. by M. Jacobs. Blackwell: Oxford.

Gunningham, N. – Grabosky, P. (1999) *Smart Regulation: Designing Environmental Policy.* Clarendon Press: Oxford.

Hajer, M. (1996) *The politics of environmental discourse: ecological modernization and the policy process*. OUP: Oxford.

Hancher, L. – Moran, M. (1989) *Capitalism, Culture and Economic Regulation.* Clarendon Press: Oxford.

Hawkins, K. (1984) *Environment and Enforcement: Regulation and the Social Definition of Pollution*. Clarendon Press: Oxford.

Hutter, B. (1997) *Compliance: Regulation and the Environment*. Clarendon Press: Oxford.

Lahusen, C. (2000) The Good Government: Cooperative Environmental Regulation in a Comparative Perspective. *European Environment*, 10 (6) 253–264.

Löfstedt, R. – Vogel, D. (2001) The Changing Character of Regulation: A Comparison of Europe and the United States. *Risk Analysis*, 21 (3): 399–405.

Mol, A. – Spaargaren, G. (2000) Ecological Modernisation Theory in Debate: A Review. In: *Ecological Modernisation Around the World: Perspectives and Critical Debates,* ed. by A. Mol – D. Sonnenfeld. Frank Cass: London.

Murphy, J. – Gouldson, A. (2000) Environmental policy and industrial innovation: integrating environment and economy through ecological modernisation. *Geoforum,* 31 (1): 33–44.

Ogus, A. (1994) *Regulation: Legal Form and Economic Theory*. Clarendon Press: Oxford

Ostrom, E. – Schroeder, L. – Wynne, S. (1993) *Institutional Incentives and Sustainable Development*. Westview Press: Boulder.

RCEP (1998) *Twenty-First Report: Setting Environmental Standards*. Com 4794. HMSO: London.

Renn, O. (2001) Commentary on Löfstedt, R. and Vogel, D. The Changing Character of Regulation: A Comparison of Europe and the United States. *Risk Analysis*, 21 (3) 406–410.

Rhodes, R. – Marsh, D. (1992a) Policy Networks in British Politics: A Critique of Existing Approaches. In: *Policy Networks in British Government*, ed. by D. Marsh – R. Rhodes. Clarendon Press: Oxford.

Rhodes, R. – Marsh, D. (1992b) New Directions in the Study of Policy Networks. *European Journal of Political Research*, 21: 181–205.

Rydin, Y. (1999) Environmental Governance for Sustainable Urban Development: A European Model? *Local Environment*, 4: 1.

Rydin, Y. – Pennington, M. (2000) Public Participation and Local Environmental Planning: the collective action problem and the potential of social capital. *Local Environment,* 5 (2):153–169.

Scholz, J. (1984) Cooperation, Deterrence and the Ecology of Regulatory Enforcement. *Law and Society Review*, 18 (2): 179–224.

Scholz, J. (1991) Cooperative Regulatory Enforcement and the Politics of Administrative Effectiveness. *American Political Science Review*, 85 (1): 115–136.

Sigler, J. – Murphy, J. (1988) *Interactive Corporate Compliance: An Alternative to Regulatory Compulsion.* Quorum Books: New York.

Skea, J. – Smith, A. (1998) Integrating Pollution Control: European Directives, British Practice. In: *Britain in Europe: Environmental Policy in Transition*, ed. by P. Lowe. Routledge: London.

Smith, A. (1997) *Integrated Pollution Control*. Ashgate: Aldershot.

Vogel, D. (1986) *National Styles of Regulation: Environmental Policy in Great Britain and the United States*. Cornell University Press: Ithaca.

Wätzold, F. – Bültmann, A. – Eames, M. – Lulofs, K. – Schucht, S. (2001) EMAS and regulatory relief in Europe: lessons from national experience. *European Environment,* 11 (1): 37–48.

Young, S (2000) The Origins and Evolving Nature of Ecological Modernisation. In: *The Emergence of Ecological Modernisation*, ed. by S. Young. Routledge: London.

4. ENVIRONMENTAL REPORTING: THE MISSING LINK

Iain Wright

Abstract

Environmental reporting developed from practical and academic interest in corporate social reporting, which itself became topical originally in the 1980's. In recent years companies have extended their reporting into sustainability issues, reflecting greater stakeholder awareness of their impact on economic, social and environmental matters. This trend has not, however, reflected the broadening academic concern which promotes the inclusion of environmental economics in the analysis. The implications arising from the use of apparently free – but exhaustible - natural capital assets continue to be ignored in corporate reports. This chapter suggests that these significant issues deserve further consideration and implementation.

4.1 Introduction

Environmental reporting has a long, if somewhat chequered, history of development. The legislation creating limited liability companies in the United Kingdom in the mid nineteenth century required the provision of an annual balance sheet, which was supplemented in the Companies Act 1900 by a form of profit and loss account. Subsequent legislation during the following hundred years extended this accountability, which is at present summarised in the Companies Act 1985, as amended in 1989. In the last thirty years the introduction of accounting standards has acted as a significant – and generally successful – influence on the provision of true and fair financial information by limited companies and other organisations not formally subject to the provisions of this legislation.

A seminal publication, which recognised the importance of providing information to users of financial statements, was *"The Corporate Report"* (ASSC 1975), which introduced to a much wider audience the need for significant economic entities to provide useful information to recognisable user groups. Its publication coincided with a gradual acceptance during that decade of the validity of corporate social reporting, whereby companies began to include non-financial indicators of performance in their annual reports. This

trend somewhat faded away during the following decade, but became more widespread from the early 1990's; recent studies have shown the extent to which companies are now publishing Corporate Social Responsibility reports in addition to their annual reports, for consumption by relevant interested parties (Knight et al 2004; KPMG 2002).

Environmental reporting (ER) has arisen as a subset of corporate social reporting (CSR), having its UK origins in the early 1990's and becoming more extensive year by year ever since. The practice has been encouraged by a concomitant rise in concern for environmental issues, driven by a combination of awareness, for example, of global warming; man-made environmental disasters (Seveso 1976, Bhopal 1984 and Chernobyl 1989); and increasing expectation by stakeholders of the provision of relevant information by the corporations whose impact on society became ever more apparent (Gray 1990). After reviewing a number of external pressures on UK companies, including domestic legislation, supranational influence and user groups, Owen (1992, 150) concludes that "*simple corporate self-interest represents the most immediate pressure for change in responding to current heightened levels of green awareness"*.

The last stage in this progression to date has been the transformation of environmental reporting into the much broader concept of sustainability reporting (SR), which has added economic and social aspects to the previous analysis. It has not been easy to apply this in practice even to those entities which have embraced the idea, at least partly because no generally accepted set of reporting standards has yet been agreed, despite the efforts of a number of prominent organisations (GRI 2002; UNCTC 1992). Despite the rather pessimistic view of Cowe (1992, 134) that *"the standard setting process has a twenty-year history of trying bravely, but largely failing, to standardise reporting practice"*, improvements to the accounting standard-setting structure since 1990 have resulted in a much wider consensus within and outside the accounting profession, which might point towards prospective developments in environmental and perhaps sustainability reporting in the coming years.

This article will consider the background to environmental reporting as it is currently practised in the United Kingdom, Europe and the United States, and it will make some brief comparisons to similar reporting in Finland. It will consider the problems, which have been encountered and make suggestions as to how these might be overcome in the interests of improving accountability of companies and other significant entities, which recognise their responsibility to provide useful information to their stakeholders.

4.2 Literature Review

"Knowing what thou knowest not
Is, in a sense, omniscience."
(Piet Hein)

For many years, environmental reporting has been criticised both by its supporters and its denigrators for its weaknesses, which have included inconsistencies in the identification, measurement and disclosure of data. It is unfortunate that many of the surveys of such reports are subject to the same criticisms, despite their best intentions.

As a result, it is no more prudent to generalise about the evidence offered by the analyses than about the individual companies which comprise the surveys. Nonetheless, some fairly consistent trends can be discerned. The extent of CSR, ER and SR is becoming more pervasive (ACCA/Corporate Register 2004; Knight 2004; KPMG 1996, 1997, 1999, 2002); its breadth of disclosure is certainly increasing; and the quality of information (numerical and non-numerical) is gradually improving. The comparability of the information, however, particularly between organisations, still presents challenges to the reader.

Criticisms made by the authors of these surveys include the fact that only around 50% of the FTSE100 companies are separately reporting, that certain sectors are conspicuous by their absence from the process (Knight 2004), that many areas of potential interest are being ignored, and that there is a reluctance to go beyond a minimum baseline disclosure and level of coverage into a larger envelope (ACCA/Corporate Register 2004).

In a significant early contribution to the literature, Gray (1990) promoted the work of Pearce et al (1989) and suggested that, in general, the environmental debate was being conducted on too narrow a front. He opined that accountants had much to offer in the field, a view, which has not been borne out in practice other than by a very small number of reporters, such as Baxter Health Care, Ontario Hydro and BSO/Origin (quoted in Gray – Bebbington 2001). The difficulties of including measurable environmental data in financial statements have generally proved insurmountable, particularly in the absence of generally recognised reporting standards. These problems further reflect the challenge which such information has presented to the stakeholders who might wish to interpret the information provided.

Adams (in Owen 1992: 85) considered the responsibility, which the accounting profession might recognise in this area.

> *"There is little doubt that accounting is heavily implicated in the destruction of the environment. If by some happy chance the accounting profession at long last possesses the skills to assist in decision-making processes which have the slightest possibility of either minimising future*

> *damage or (preferably) reversing past damage, then I suggest that accountants convert this possibility into a personal duty…which should override any environmentally detrimental activities of their employers."*

There appear to be three separate, but interlinked, areas of concern in environmental reporting: identification, measurement and disclosure. Opinions vary as to the most significant of these, but many regard the views of Yankelovich (1972) as pertinent.

> *"The first step is to measure whatever can be easily measured. This is OK as far as it goes. The second step is to disregard that which can't be easily measured or give it an arbitrary quantitative value. This is artificial and misleading. The third step is to presume that what can't be easily measured really isn't important. This is blindness. The fourth step is to say that what can't be easily measured really doesn't exist. This is suicide".*

Roberts, in Owen (1992) quotes from the Norsk Hydro (Norwegian) 1990 environmental report, which stated that

> *"We believe, that the public has a right to information, and there is nothing that we want to hide. If we have a problem, it is also in our best interests that it is brought out into full public view".*

This attitude reflects well on those companies who elect to provide bad news, along with the good, for example missing previously set performance targets or admitting fatalities in the workplace. Harte and Owen, in Owen (1992, 199), found that *"information provision is generally highly selective and largely public relations driven with a virtually universal reluctance to disclose bad news".* Even allowing, as they did, for their study covering only the beginnings of environmental reporting, this message has been echoed by many observers over subsequent years.

Measurement of environmental information is widely regarded as presenting the greatest challenge to practitioners. Aside from simple matters such as the need to report quantified data in comparable units, problems have been caused by the absence of recognised and acceptable disclosure standards as well as by the alacrity of reporters to avoid presenting like for like data for consecutive years, during which the scale of operation may have been affected by, for example, plant closures. A more cynical observation, quoted by Zadek (2004, 122) is *"if you want it to count, count it"*: echoes of Yankelovich (op cit).

Consideration of disclosure issues is associated with several inter-related strands. The ACCA/Corporate Register survey (2004) noted the reluctance of companies to go beyond the minimum disclosure and coverage and that many relevant (sustainability) areas were being ignored. A Finnish study (Niskanen – Nieminen 2001) found that listed companies' disclosure of negative environmental events was negligible compared to that for positive events, where such events were publicly known beforehand. There may be some sympathy

for these attitudes from Cowe's point (in Owen 1992, 134), that "*the history of company reporting is one of the accounting profession resisting every new disclosure, usually on grounds of confidentiality*". This pessimistic view could be offset by the reasonable suggestion that ER and SR may only be facing similar trials and tribulations as have been addressed by financial reporting over recent decades, and that there may yet emerge similar light from a not too dissimilar tunnel.

The focus on the above three areas has been matched by those who extend the reporting process into consideration of the economic aspects of sustainability (Starik 1995; Tietenberg 2003; 2004, Welford 1995, 1997). Pearce et al (1989) may have been the first to stress the need to put value on the environment, to extend time horizons into the future, and to recognise inter- and intra-generational fairness, all of which are now part of the rules of the game. The metamorphosis of environmental into sustainability reporting in recent years has broadened the playing field even if not ensuring its consistent level. *"Sustainable development ….is perhaps the most important concept and challenge facing every one of us in the world today"* (Welford 1995). Economic and social measures of performance are much less well defined even than their under-developed environmental siblings. "*Accounting only measures the economic"* (Gray – Bebbington 2001, 254).

Critics of environmental measurement suggest that alternative indices to GNP offer more comprehensive analysis, for example, the Index for Sustainable Economic Welfare, on the grounds that the former fails to include social and ecological costs, and excludes aspects of economic welfare (Zadek 2004). These authors, however, accept that *"the lack of full scientific certainty should not be used as reason to postpone measures to prevent environmental degradation"* (Schaltegger et al 2003, 277). Pearce et al (1989) outlined their original belief that solving environmental problems necessarily requires solving economic problems first, a view to which they have consistently adhered during the subsequent decade. This philosophy will be explored further below.

A commonly cited definition of sustainable development was given by the Brundtland Commission (WCED 1987); it can be more succinctly expressed as an increase in well-being today should not result in a reduction in well-being tomorrow, or as *"per capita well-being should not be declining over time"* (Pezzey 1992). How to achieve the inherent objective of inter-generational fairness is by no means clear, even if the argument itself is accepted by those companies outwardly embracing sustainability reporting. But the urgency of the question is summarised by Ketola (1997, 135), where she states that if companies do not change their attitude, *"their days are numbered. They will either be forced to bankruptcy by their business environment which will demand the full costing of companies' ecological impacts in the new*

world of Ecological Eldorado – or they will perish with humans and other species when the ecosystem collapses". Her definition of 'Ecological Eldorado' is a world where human activities do not exceed the carrying capacity of the ecosystem.

Indicators of sustainable development are themselves open to much debate. Anderson (1991) suggested they should be about something measurable, meaningful, easy to understand, with a short time lag between the state of affairs and their becoming available, and comparable geographically – an optimistic shopping list, indeed! A Foreign Policy Centre report (2001, in Zadek 2004) suggested the need for Generally Applicable Accounting Principles for Sustainability, to cover all three aspects of sustainability and which would be supported by the UK government. Earlier reference above to the painful emergence of accounting standards, combined with the only too apparent reluctance of government in the UK to address its own environmental agenda in practice (ENDS 2004), suggest that this view may be rather too sanguine.

Economics has for long been described as the dismal science, but for environmental economists there has been little for them to be happy about during the last decade. Despite the recognition being accorded by many to the need to attribute value to the environment (Pearce et al 1989; Pearce and Barbier 2000, Tietenberg 2004) very little of the theoretical analysis has been incorporated in practical reporting on the ground – or in the water or the air, for that matter. Pearce observed in his Preface (1993, xiv) that *"sustainable development is more fashionable in 1993 than it was in 1989"*; but his implied optimism appears to have borne little fruit in subsequent years. Within the generally accepted categories of man-made and natural capital, academics have identified weak and strong versions of sustainability, but their deliberations have not been pursued in published corporate reports. "*Despite reams of press about the state of the environment….the stock of natural capital is plummeting and the vital life-giving services that flow from it are critical to our prosperity"* (Hawken et al 1999, 3). Even the economists find it hard to arrive at consensus over the appropriate valuations: *"While there may be no 'right' way to value a forest, a river, or a child, the wrong way is to give it no value at all"* (ibid, 321).

Techniques such as cost-benefit analysis, non-use value and the contingent valuation method have been offered as means of introducing quantitative analysis to address natural capital estimations, but there is once again little evidence of their being applied by companies. The dangers of applying numerical solutions to qualitative problems were well illustrated by Churchman (1971); the problems of so doing have been outlined by Hawken et al (op cit, 321), as "*if there are doubts about how to value a seven-hundred-year-old*

tree, ask how much it would cost to make a new one". But the over-riding significance of the contribution made to human existence by the constituents of natural capital is emphasised by Schumacher (1974, 42), who stated that primary goods *"are nonetheless an essential precondition of all human activity, such as air, water, the soil, and in fact the whole framework of living nature"*. Tietenberg (2004, 90) concludes that under strong sustainability, *"the value of the remaining stock of natural capital should not decrease... (as)… natural and physical capital offers limited substitution possibilities"*. These sentiments have become widely recognised both in the literature and in the minds of the public in the last decade, but only in very few cases have they been translated into published environmental or sustainability reports. This review of the literature now leads into a consideration of current reporting practices in several countries, which illustrates the challenges of translating theory into effective practice.

4.3 Current Reporting Practice

> *"O wad some Pow'r the giftie gie us*
> *To see oursels as ithers see us !"*
> (Burns)

Analysis of reporting practice is open to criticism due to its inherent selectivity, if not explicit bias. This article will therefore consider the findings of several recent surveys, which covered companies in the United Kingdom, Europe, the United States and the Global Fortune 250 companies (ACCA 2003; ESRA 2003; KPMG 2002; PwC 2002). Readers are referred to the individual surveys for further detail and explanation.

The first of these relates to the awards made by ACCA for sustainable and environmental reporting in the UK, in printed or electronic format. The judges' report comments on the importance attached to materiality, to internalising externalities and to the general absence of any mention of climate change. The ACCA's European awards report praises the year-on-year improvements in reporting on the process of sustainable development but laments the lack of balance between the three elements of sustainability itself. The PwC survey, of 140 responding large US companies, finds that 75% *"say they have adopted some sustainable business practices"*, with the majority citing enhanced reputation, competitive advantages and cost savings as the reasons, but only 32% issue a sustainability report. Finally, the KPMG survey of the top 250 of the Global Fortune 500 companies found that only 16 had produced sustainability reports and a further 96 issued HSE or social reports. Three quarters of the KPMG reporters referred to climate change and global

warming, despite the unwillingness of the USA to recognise the Kyoto Protocol; the survey suggests that for companies with more mature environmental management systems, *"biodiversity as a secondary impact is moving up the agenda"* (KPMG 2002, 23).

Examination of the report of the winner of both the UK and European Sustainability Reporting Awards in 2002, the Co-operative Bank (2002), provides a wealth of statistical, graphical and narrative ecological information, which must clearly have impressed the judging panel. Frequent reference is made to four scientific principles of which the most relevant might be "*the productive area of Nature must not be diminished in quality (diversity) or quantity (volume) and must be enabled to grow"* (Co-operative Bank 2002, 62). A similar sentiment is found in the Novo Nordisk Sustainability Report 2003, where it states that *"our overall goal is to move in the direction of dematerialising our production, 'producing more with less'"*, which *"involves further developing our tools for economic assessment of and accounting for environmental costs and investments"* (Novo Nordisk 2003, 44). The company's 2002 report was the Danish entrant and the overall winner of the European Awards in 2003.

No Finnish company won either the ESRA Sustainability or Environmental category in the last two years: entries came respectively from Kesko Corporation and Wartsila and from Rautaruukki Oyj and Proventia Group in the latter category. Wartsila's Sustainability Report 2002 reveals that its mission includes *"developing equipment and services that convert fuels into power efficiently and with the lowest possible environmental impact"* (Wartsila 2002, 4), a laudable if somewhat imprecise objective. The company provides ship power and power plant generation equipment, the former of whose environmental properties are described as *"those elements of practices, products and services that have an effect on the environment. The environmental aspects of a product are mainly related to its use"* (Wartsila 2002, 30). Despite the longevity of this company's products, this statement does not appear to pay even lip service to the concept of sustainable development.

A contrasting approach is taken by Outokumpu's Environmental Report 2002, where the group's aim *"is to monitor how we have developed our operations and achieved our goals in environmental, social and economic performance as well as how we influence, and can influence the metals life cycle at its various stages"* (IFC). However, the following year's Review is less positive, stating its wish to *"ensure that our operations are in compliance with regulations and do not cause harm in the fields of environment, occupational health and safety"* (Outokumpu 2003).

Selection and analysis of a few environmental reports is clearly lacking in rigour and breadth, but these examples show the variety of statements con-

tained in such reports, and illustrate the challenge faced by organisations in attempting to meet the academic criteria proposed by the literature. Perhaps it is not unfair to conclude that there is little evidence of an extensive application of the principles of environmental value, futurity and equity in the present reporting process, whose predominantly voluntary nature will be examined in the next section.

4.4 Volunteers or Pressed Men?

For most of its lifetime, environmental reporting has been a voluntary undertaking: a laissez-faire regime has allowed reporting entities to experiment either individually, or within industry-based guidelines which have attempted to encourage some consistency between competitors. Various documents have been promulgated to attract the support of relevant organisations: the Coalition for Environmentally Responsible Economies Principles (formerly the Valdez Principles) (CERES 1995); the International Chamber of Commerce's Business Charter for Sustainable Development; and the Chemical Industry Association's Responsible Care Programme. However, despite their best intentions, none of these has been sufficiently widely supported or effective as to warrant the description of an industry standard.

Considerably greater progress has been made by the Global Reporting Initiative, a voluntary organisation now based in Amsterdam, which enjoys substantial funding and support from the United Nations. Its mission is to provide a standardised and generally accepted sustainability reporting framework to its multi-stakeholder membership. Its Guidelines were first published in 2000 and revised in 2002 (GRI 2002); they are now cited by over five hundred organisations worldwide (ACCA/Corporate Register 2004) and have achieved something of a cult status. The Guidelines contain indicators of environmental, social and economic performance, and are to be further revised by 2006 along with an extended discussion on assurance, which is at present not mandatory for all such reports.

In contrast to these voluntary initiatives, a number of countries have introduced some form of required environmental reporting within the annual financial reporting process (KPMG 2002). Stand-alone reports in Denmark and the Netherlands must comply with national legislation, while in Belgium, France, the Netherlands, Norway, Spain, Sweden and (very shortly) the United Kingdom, statutory provisions on disclosure of environmental issues apply to the annual report (Hibbitt – Collison 2004). To date, there appear to be no equivalent requirements in Finland.

There are two further sources of voluntary compliance available to companies, through registration with the European Union Eco-Management and Audit Scheme and separately, through achieving certification under ISO 14001. The first of these schemes was revised in 2001 (see Hibbitt – Collison 2004, 1) to require integration of the latter as the EMS, amongst other changes, which may have the effect of reversing the declining number of registrants. The growth in certificates issued under ISO accreditation was 34% in 2003, reaching 66,070 companies worldwide (ENDS 2004), of which Japan had approximately 16,700, the UK over 5,460 and Finland 888 (Peglau 2005). This popularity can at least be in part attributed to the fact that ISO14001 excludes any disclosure or rigorous verification requirements. The contrast with EMAS is very clear, whose more stringent requirements have seen a gradual decline in its adherents, to just under 3,100 in December 2004 (EMAS 2005).

It is interesting to compare these registrations using the population of the countries as a base. Under EMAS, Denmark is the leader with 46 sites per million of population, followed by Austria (41) and Germany (26); Finland has 8 and the UK only 1. Under ISO14001, Finland is ahead with 178 certifications, followed by Denmark (142), Japan (133) and Spain (123); the UK has 92 and China only 4, although Hong Kong has 49.

These conflicting attitudes towards compliance and disclosure may be compared to the situation in Hong Kong, where the public sector drives the quality and extensive quantity of environmental disclosure. The Hong Kong Environmental Protection Department has extensive powers to require the provision of environmental reports by each of the region's government departments, from whose example it is hoped that at least the largest companies in the private sector will follow suit voluntarily.

4.5 Conclusions

> *"All's well that ends well"*
> (William Shakespeare)

This paper has sought to demonstrate the gap between the academic literature on environmental and sustainable reporting, on the one hand, and current achievements by the organisations which might most benefit from these deliberations. Despite the significant improvements which have been achieved by the latter since the Brundtland Report was published (WCED 1987), there is little evidence that the rigour and logic of environmental economics have been applied extensively to the preparation and publication of these reports.

Lars Georg Jensen, programme co-ordinator for global policy in the Danish chapter of the World Wide Fund for Nature, stated that

> *"…environmental considerations can no longer be something that you recognise when times are good and profits are high. That is why the Kyoto Protocol is based on the assumption that wealth and environmental protection are not mutually exclusive – neither for states nor for companies" (Jensen in Novo Nordisk 2003, 47).*

The potential to develop the quality and quantity of environmental reporting is undoubtedly present in many countries and jurisdictions of the world. Legislators are taking more and more interest in a perceived need for disclosure of the impact, which, particularly large, organisations have on society in its broadest sense. In a world in which fifty-one of the hundred largest economies in the world are corporations and the top two hundred corporations' sales equal one quarter of the world's total economic activity (Zadek – Merme 2003), it is imperative that a greater degree of accountability be brought to bear on the situation. Corporate Social Responsibility is once again becoming a topic of debate. Enlightened management may succeed in developing their companies to prosper in the future by applying the principles of corporate citizenship, but the disappointing prevalence of the laissez-faire approach may be found wanting.

References

ASSC (1975) *The Corporate Report*. Accounting Standards Steering Committee: London.

ACCA (2004) *ACCA UK Awards for Sustainability Reporting 2003. Report of the Judges.* Certified Accountants Educational Trust: London.

ACCA/Corporate Register (2004) *Towards Transparency: progress on global sustainable reporting*. Association of Certified Chartered Accountants: London

Billing, R.C. et al (1994) *Reporting on Environmental Performance*. Canadian Institute of Chartered Accountants: Toronto.

Burns, R. *To a Louse.*

Churchman, C.W. (1971) On the Facility, Felicity and Morality of Measuring Social Change. *The Accounting Review*, XLVI, January: 30–35.

CERES (1995) *Guide to the CERES Principles*, Coalition for Environmentally Responsible Economies: Boston.

Co-operative Bank (2003) *Sustainable Development: Partnership Report 2002*. Co-operative Bank p.l.c.: Manchester.

Dobson, A. (2000) *Green Political Thought*. Routledge: London.

Elkington, J (1997) *Cannibals with Forks : the triple bottom line of 21st century business.* Capstone Publishing: Oxford

EMAS (2005) statistics, at http://europa.eu.int/comm/environment/emas/index_en.htm accessed 24 Jan 2005.

ENDS (2004) *ENDS Report*. December. Environmental Data Services.

ESRA (2003) *Report of the Judges*. European Sustainability Reporting Awards.

GRI (2002) *2002 Sustainability Reporting Guidelines*. Global Reporting Initiative: Amsterdam.

Gray, R.H. (1990) *The Greening of Accountancy*. ACCA: London.

Gray, R.H. – Bebbington, J. (2001) *Accounting for the Environment*. Second edition. Sage Publications: London

Gray, R.H. – Owen, D. – Adams, C (1996) *Accounting and Accountability: challenges in corporate social and environmental reporting*. Prentice-Hall: London.

Hawken, P. – Lovins, A.B. – Lovins, L.H. (1999) *Natural Capitalism*. Earthscan: London

Hein, P. (1969) *Omniscience*. Grooks 1. General Publishing Company: Don Mills, Ontario.

Hibbitt, C. – Collison, D. (2004) Corporate Environmental Disclosure and Reporting in Europe, *Social and Environmental Accounting*, 24 (1): 1–11.

Ketola, T. (1997) Ecological Eldorado: Eliminating Excess over Ecology. In: *Hijacking Environmentalism: Corporate Responses to Sustainable Development,* ed. by R. Welford, 99–136. Earthscan: London.

Knight, P. et al (2004) *Directions 3: Trends in Corporate Social Reporting* Context/salterbaxter: London.

KPMG (1996) *UK Environmental Reporting Survey.* KPMG: London.

KPMG (1997) *Survey of Environmental Reporting*. KPMG: London.

KPMG (1999) *International Survey of Environmental Reporting*. KPMG: De Meern.

KPMG (2002) *International Survey of Corporate Sustainability Reporting*. KPMG: De Meern.

Niskanen, J. – Nieminen, T. (2001) The Objective of Corporate Environmental Reporting: a study of Finnish listed firms' environmental disclosures. *Business Strategy and the Environment*, 10: 29–37.

Novo Nordisk (2003) *Sustainability Report.* Novo Nordisk A/S: Bagsvaerd.

Outokumpu (2002) *Outokumpu and the Environment*. Outokumpu Group: Espoo.

Outokumpu (2003) *Environmental Review*. Outokumpu Group: Espoo.

Owen, D. (ed.) (1992) *Green Reporting: Accountancy and the challenge of the nineties*. Chapman and Hall: London.

Pearce, D et al (1993) *Blueprint 3: measuring sustainable development*. Earthscan: London.

Pearce, D. – Barbier, E.B. (2000) *Blueprint for a Sustainable Economy*. Earthscan: London.

Pearce, D. – Markandya, A. – Barbier, E.B. (1989) *Blueprint for a Green Economy*. Earthscan: London.

Peglau, R. (2005) ISO 14001 certification, www.ecology.or.jp/isoworld/ english/analy14k.htm accessed 24 Jan 2005.

Pezzey, J. (1992) Sustainability. *Environmental Values*, 4. 321–362.

PwC (2002) *Sustainability Survey Report*. PricewaterhouseCoopers LLP: USA.

Schaltegger, S. – Burritt, R. – Petersen, H (2003) *Introduction to Corporate Environmental Management: striving for sustainability*. Greenleaf Publishing: Sheffield.

Schumacher, E.F. (1974) *Small is Beautiful*. Abacus: London.

Shakespeare, W. *All's Well That Ends Well.*

Starik, M. (1995) Should Trees Have Managerial Standing? Towards stakeholder status for non-human nature, *Journal of Business Ethics*, 14: 207–217.

Tietenberg, T. (2003) *Environment and Natural Resource Economics.* Addison Wesley: Boston.

Tietenberg, T. (2004) *Environmental Economics and Policy*. Pearson: Boston.

UNCTC (1992) *International Accounting and Reporting*. United Nations Centre for Transnational Corporations: New York.

Wartsila (2002) Corporation, Sustainability Report. Wartsila Corporation: Helsinki.

Welford, R. (1995) *Environmental Strategy and Sustainable Development.* Routledge: London.

Welford, R. (1997) *Hijacking Environmentalism: corporate responses to sustainable development*. Earthscan: London.

WCED (1987) *Our Common Future*. World Commission on Environment and Development. Oxford University Press: Oxford.

Yankelovich, D. (1972) *Corporate Principles: a continuing study of the new demands on business*. Daniel Yankelovich Inc: Stamford.

Zadek, S. (2004) *Tomorrow's History*. Greenleaf/AccountAbility: London.

5. ECOLOGICAL MODERNIZATION AND ITS CONTRADICTIONS: CORPORATE GREENING IN HUNGARY IN THE 1990s*

György Pataki

Abstract

The present paper reports on a research that aims at interpreting processes of corporate greening after socio-political regime change in Hungary during the 1990s. A typology of conceptualisations of corporate greening is presented based on a review of the relevant literature. Based upon the analyses of seven case studies, different themes emerged as having explanatory power. The domain of social structures is introduced: socio-political regime change and privatization. Themes of individual and intersubjective level of corporate greening will be presented: role of leadership and environmental managers. Three legitimacy discources will be outlined: 'becoming European', 'modern equals with environmentally sound', and 'free market environmentalism'. It is pointed out that legitimacy discourses are embracing a particular ordering of social reality: 'ecological modernization'.

5.1 Introduction

Particularly from the 1990s on, management and organization studies have increasingly turned towards the issues of ecology – i.e. environmental pollution, clean technology development, eco-product design and development, etc. – and the possible ways of theoretical conceptualisation. Though it can be argued that mainstream management and organization research has not been radically transformed, as some authors would have seen, or called upon, it

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(Shrivastava 1991; Purser – Park – Montuori 1995), new scientific and more popular journals were established and exclusively devoted to the subject matter (such as the *Business Strategy and the Environment*, *Corporate Environmental Strategy*, *Greener Management International*, *Journal of Cleaner Production*, *Journal of Industrial Ecology*, etc.).

However, one may also judge the emerging literature on organizational environmental management (or organizational greening) as one still in its initial phase of disciplinary development, both theoretically as well as methodologically (Gladwin 1993; Räsänen – Meriläinen – Lovio 1995; Welford 1998; Newton 2002).

Moreover, one may also sense that this phase is dominated by managerialist approaches of the issues involved, though some authors (e. g. Newton – Harte 1997) have already attempted to draw, sometimes quite provocative, conclusions reflecting upon the state-of-the-art in order to push disciplinary endeavours into methodologically and theoretically more demanding directions. These calls have been not without success, as the growing body, and ways, of theorizing organizational greening demonstrates. Some authors employed institutional theory to explain processes of organizational greening (see Halme 1996, Hoffman 1999, 2001); while others conceptualized the problem of greening either through social constructivist lens (Fineman 1996, 1997; Fineman – Clarke 1996; Crane 1997, 2000) or by putting their emphasis upon power relations and dynamics (Levy – Rothenberg 1999; Orssatto – Clegg 1999; Orsato – den Hond – Clegg 2002).

The present paper reports on a research effort that aimed at describing, interpreting and analysing processes of corporate greening after socio-political regime change in Hungary during the 1990s. Greening is understood here as any organizational processes, events, and interpretations that have some ecological relevance (including those organizational actions that are intended to have an ecological impact as well as those that have additional, perhaps unintended, ecological effects). It should also be emphasised that this work is completely different from those efforts still dominating the extant literature that attempt to delineate and prescribe the best practices of corporate environmental management that one might call the ‘environmental excellence literature’.

Although the empirical research reported below is mainly focused on Hungarian corporations considered to be leaders in environmental management, there is no intention to produce a managerialist account of corporate greening. In contrast, following the spirit of critical social research, the intention is more to understand and reflect upon the possibilities and limits of an instrumental, or means-ends, rationality, which is manifest in modern management sciences as well as practice, with regard to ecological problems and imperatives.

Modern organizations and instrumentally oriented organisational sciences offer a universal solution for social order (Reed 1996). It is believed that, as modernity and modern life is overwhelmingly lived by and with large bureaucratic organizations, researchers should be very sensitive to the impacts of this organizing logic (Alvesson – Willmott 1992).

5.2 Critical Reflections on Theories of Organizational Greening

In this section, an attempt is made to briefly summarize different interpretations of corporate greening prevalent in the relevant literature (that are explicated in details in Pataki 2003). Any theoretical experiment of this type should confront the problem of somehow limiting its reach in order to make the chosen task manageable, given the huge amount of writings on organizational greening. The typology of the literature on greening presented below restricts itself to those theoretical perspectives and models that can be placed within the discipline of organization studies and that concentrates upon business corporations (therefore, organizational and corporate greening is used here interchangeably). Two previous studies helped to keep the present analysis on track: Gladwin (1993) presented the classic lines of organizational theorizing concerning the meaning of corporate greening, and Räsänen Meriläinen and Lovio (1995) provided a first classification of 'pioneering descriptions of corporate greening', according to views on the nature of organizational change assumed. Table 1 presents the typology developed here.

Table 1. A Typology of Literature on Organizational Greening.

Greening as		
1. Environmental Strategy Choice	2. Organizational Change	3. Institutional Change
1.1. excellence literature	2.1. process approaches: 2.1.1. change in strategic management 2.1.2. organizational learning	3.1. social constructionist approaches
1.2. stage and categorical models	2.2. content approaches: 2.2.1. technological change 2.2.2. cultural change	3.2. co-evolutionary approaches
1.3. market and/or non-market strategy		3.3. political-economic approaches

Within organization studies on corporate greening, three main interpretations of greening are differentiated. The first strand of thinking that interprets corporate greening as choice of *the* proper strategy has a straightforward func-

tionalist tenet and, thus, is closely related to the well-known contingency theory of organisations. The interpretation of corporate greening as a choice of environmental strategy may be further separated into three strands of thinking. The first one can be termed ‘environmental excellence literature’. Authors writing in this vein provide a list of tools and methods for implementing ‘environmental best practices’ that lead to improving environmental performance and simultaneously the bottom line (Newman – Breeden 1992; Dechant – Altman 1994; Elkington 1994). Receipts for business success are prescribed in order to ‘fix’ environmental problems. Corporate greening is thus described and explained by the excellence perspective as a rational managerial choice and application of the best environmental management tool-kit, including technological as well as cultural ‘solutions’.

The second approach analyzes corporate greening as either a categorical choice of ‘the proper’ environmental strategy or a developmental process along the stages of environmental strategy improvement (Haas 1996). Categorical models of corporate environmental strategy (e.g. Steger 1993) separate a few environmental strategy postures and claim that depending upon the nature of environmental challenge as well as the economic sector to which the firm in question belongs, there is always a first-best environmental strategy choice. Obviously, the role to rationally decide upon the right ‘strategic fit’ is a job of top managers. In contrast, the stage models of corporate environmental strategy prescribe steps towards improving environmental management or performance (Roome 1992; Hart 1995). Here a socio-evolutionary necessity is claimed whereby successful companies, and managers, gradually climb up an ‘environmental learning curve’ to reach some ideal of a ‘sustainable corporation’.

The third strand of analysis of corporate environmental strategy interprets corporate strategy as an integration of market and nonmarket strategies in a synergistic fashion (Schot 1992; Maxwell et al 1997; Reinhardt 1997). The rational managerial job here is one of analyzing the core capabilities and the stakeholder context of the focal organization and aligning greening efforts with them in a way whereby developing core environmental capabilities and responding to powerful stakeholder pressures are mutually supportive.

Related to the clear functionalist orientation of organizational greening as choice of strategy, another major tenet is a ‘rationalistic’ and managerialist perspective: the general environment of the focal organization is differentiated only to the extent of identifying different environmental demands and the focal organisation is represented only by a managerial body making strategic decisions (that is, rational choice of the proper environmental strategy).

The second main interpretation emphasizes greening as a process of organizational change. Four streams of analysis may be separated here, according to

whether they emphasize either the process (‘how?’) or the content (‘what?’) of change. Within the ‘process perspective’ on organizational change, one group of authors concentrates on the process of strategic management – how to incorporate environmental considerations into the process of strategic management? ’Environmentally adjusted’ strategic management models complement the conventional strategic management feedback, or developmental, model by an environmental capability, as well as stakeholder, analysis or by greening the Porterian value chain to improve the ’pollution portfolio’ of the focal organization (Starik et al 1997).

Another group of researchers of the ’process perspective’ relies on the models of organizational learning and conceptualize greening as processes of learning. The conceptualization is made in terms directly borrowed from the most eminent authors of organizational learning, such as single- and double-loop learning, tacit knowledge, or unlearning (Post – Altman 1994; Banerjee 1998). These studies reach quite bold conclusions, simply positing a dichotomy between successful organizations capable of double-loop learning and unsuccessful ones demonstrating single-loop learning at best. Some authors within this frame of reference are rather look for the ’drivers’ of environmental learning, such as regulation, market, values, etc. (see Vickers – Cordey-Hayes 1999).

The other two interpretations of greening as organizational change focus on the content of change (that is, ‘what is changing?’) in corporate greening. One approach interprets greening as technological change; the other describes, or prescribes, it as culture change. The main feature of these kinds of environmental technology studies (e.g. Shrivastava 1995) is that they are silent with regard to the possible mechanisms of technology change – therefore, they fall short of true dynamism. These studies seem to think in terms of an autonomous logic of technology development that inevitably leads towards better, in this case more environmentally sound, technological solutions. In fact, they promote a ’technology fix’ approach towards issues of ecology.

A number of authors obviously call for culture change, i.e. more environmentally responsible actors as well as organizations, while discussing organizational greening (e.g. Stead – Stead 1994). They seem to think of organizational culture that something that can be ’managed’ and the most successful ways of managing can be uncovered or understood, then followed. Here, one finds models that are dynamic to the extent that clarify steps or stages of managing for green organizational cultures (Halme 1997). However, most of these studies operate with a unitary concept of culture and, consequently, promote a ’culture fix’ approach to solving the problem of ecology (Dodge 1997, Jones – Welford 1997).

Organizational change perspectives at best introduce dynamic aspects of greening, though they restrict them to internal organizational processes without including interactions with factors and processes of the general environment of the focal organisation in the analysis. The organizational theoretic paradigm followed by these studies is mainly of a functionalist and managerialist nature, though some studies follow a behavioural model of organizations.

The third major interpretation of corporate greening is labelled here as institutional, although this time, this term is applied to a grouping of theoretical perspectives that are usually considered divergent. However, here they are grouped together, since they radically depart from the other two major interpretations due to the non-functionalist and non-managerialist stance of their analyses. In more positive terms, all three perspectives included here – termed social constructionist, co-evolutionary and political-economic, respectively – share a fundamentally critical epistemology and a focus upon institutionalized practices and, in particular, power relations. Consequently, they integrate into the analysis of organizational greening the dynamic and constitutive interactions and processes of the focal organizations vis-à-vis the general environment.

Social constructivist studies on organizational greening (especially Fineman 1996, 1997, Crane 1997) reveal the 'moral disengagement mechanisms' (Bandura 1991) institutionalized in the language of business by which managers frequently disengage themselves of the ethical dimensions of their organizational actions. According to Fineman (1996) analysis of the 'emotional subtexts' of organizational greening, the green commitment enacted by managers even in the 'greenest' companies is a result of 'corporate cultural engineering' rather than 'a substantive sense of care or concern for others'. Beyond the narratives and rhetoric provided by organizational culture, managers approached environmental issues first by 're-framing and de-emotionalising', as well as 'amoralizing', them, eventually translating them into 'safe business language' (inventing terms for example like 'total quality environmental management'). Relatedly, in a series of studies Crane (1995, 1997, 2000) reveals the micropolitical processes and the relatedly 'enacted amoralizing dynamics' of corporate greening. He concludes that

> *"as powerful [organizational] groups begin to subjectively characterize greening in a certain (largely amoral) way …, this particular interpretation tends to become institutionalized over time as objective truth … Hence, the possibility for moral autonomy and reflection in the greening process becomes suffocated by the instinctive adherence to routinely declared and re-iterated corporate values as presented in formal company communications and literature." (Crane 2000, 689)*

In contrast to organizational greening as technology change, studies termed here as a co-evolutionary perspective conceptualize technology as an institu-

tion, providing agents with technical, human, social, as well as political resources (Green – Miles 1996). Technology co-evolves with the economic, social and political context – thus, constitutes a 'technological regime' (Kemp et al 1998). A technological regime is inherently political in nature since each innovation takes place in a 'social niche' not only in a purely technological one; a social network emerges around a certain technological alternative (Verheul – Vergragt 1995). This formation of a constituency behind a technology can, paradoxically, lead to serious constraints to, as well as opportunities for, the development and diffusion of more sustainable technologies. As the concept of technological regimes points out, the cognitive structure of a 'technological paradigm' is embedded in broader technical systems, in established production practices and routines, supplier-user relationships, consumption patterns, and institutional arrangements infused with values. Therefore, it is necessary to add a macro-structural (or institutional) dimension to these cognitive structures operating at the individual, organizational, as well as sectoral, levels. There is a process of institutionalization, from cognition to taken-for-granted 'templates of organizing' (Greenwood – Hinings 1996), to which it is typical that in the

> *"...processes of technological innovation ... decisions about start, direction, branching and termination were taken in groups or networks that shared a certain common problem definition. These networks and these common problem definitions define each other. ...networks develop over time, responding to certain requirements relating to phases in the innovative processes. Networks grow, become more complex and eventually become latent structures that support an existing technology." (Vergragt – van Noort 1996, 172)*

The third research stream in organizational greening as institutional change is termed here as a political-economic perspective. Studies grouped here together share a common unifying theme, namely, their continuing reflection upon relations of power at the macro-structural level. They highlight the inherently political nature, or power dimensions, of corporate strategy making, as they radicalize the concept of integrated strategy, developed by Baron (1995), by emphasizing the interaction of corporate political and product strategies. This implies that corporate environmental strategies focus not only upon protecting specific products or markets but a wider social-technological regime – a regime that provides particular systematic advantages to the 'proper' corporate strategies. In this sense, every environmental strategy, indeed every corporate strategy, is political in nature. Studies also concentrate upon the 'discursive structure of meaning and symbolism' attached to organizational greening by analyzing the power struggles among 'discursive coalitions' (Levy – Rothenberg 1999). Moreover, this research stream calls into question the operation of the 'science-industrial complex', as well as govern-

ment-industry relations, pointing to the efforts and ways of corporations attempting to de-politicize organizational greening (Simmons – Wynne 1993).

By labelling the public in general and environmentalists in particular as lay people who are ignorant of scientific facts and relationships, industry representatives employ a discursive strategy that aims to exclude many stakeholders from dialogues related to environmental policy making. They intend to restrict the subject matter of environmental policy discourses to 'rigorous' science and technical issues related to pollution standards or compliance. These studies, in another sense, reveal the institutional dimensions of growing public mistrust towards and loss of legitimacy of the corporate world of business (cf. risk society and risk culture). Furthermore, it is shown how senior corporate executives of MNCs use their power globally in defining and shaping the sustainability agenda according to their hegemonic development paradigm, that is, 'liberal-productivism' (Mayhew 1997).

From the perspective of social theory, it is clear that only the perspectives conceptualizing organizational greening as institutional change has much to say, as they attempt to theorize both micro- and macro-level phenomena, or the interplay between agency and structure.[13] However, in this respect there are clear differences among the three approaches identified above (under greening as institutional change). Social constructionist approaches focus upon the everyday world-making and meaning-making activities of organizational actors, uncovering intraorganizational micro-political processes related to 'green talk' but also revealing enduring (i.e. institutionalized) characteristics of constructing organizational greening (such as the language of business). While their epistemological stance can readily accepted, in terms of ontology the social constructionist perspective seems to operate with a 'flat ontology' (Reed 1997) of social reality, by under-theorizing the casual power of enduring elements of social reality, except language.

The co-evolutionary and the political-economic perspectives, on the one hand, put much emphasis upon the macro-structural elements, as well as dynamics, of organizational greening. On the other, they seem to inadequately deal with micro-level processes, not crediting agency and individual encounters, their due merit in explaining, or theorizing, the opportunities and constraints of organizational greening. Their critical epistemological stance is also coupled with a 'flat ontology', collapsing explanations into the macro-structural level.

Though all the research streams of organizational greening as institutional change is considered here superior in terms of social theory to those of strategy choice and organizational change, they may be criticized at the ontological

[13] Traditionally, these approaches have been split into two broad camps: those aiming at 'interpretative analysis', and those concerned with 'institutional/structural analysis' (Giddens 1984).

level of analysis. The present paper accepts a critical realists position to social theory (Layder 1997; Reed 1997; Tsoukas 1989, 2000) that emphasizes a 'layered' or 'stratified' ontology of social reality, while insisting on the critical epistemology of social constructionism, as well as the macro-level approaches which is grouped together with above. Critical realism is against collapsing social explanations in one level, be it the micro/agency or the macro/structure level. Social analysis is believed to gain much in terms of explanatory richness and critical power if it accepts, or follows, an analytical strategy that differentiates between levels or domains of social reality, such as individual psychobiography, 'interaction order', and social structure. Though the different domains of social life cannot be reduced to each other, they intersect with and are interdependent upon one another, while social relations and positions, practices, discourses and power are binding them together (Layder 1997). In this sense, it seems worthwhile to retain a sort of dualism between different social domains in organization studies (Reed 1997; Mouzelis 2000), as opposed to collapse them into a kind of duality (such as e.g. 'structuration theory' of Giddens 1984 or 'habitus' of Bourdieu 1977).

5.3 Methodology

The objective of qualitative inquiry reported in this paper was to understand the meaning of corporate greening in Hungary during the 1990s (after the socio-political regime change). More precisely, the empirical research aimed at shedding light on the following broader questions:

1. How are ecological problems and issues interpreted by Hungarian corporations, their managers and employees? What kinds of discourse or narratives are applied when dealing with ecological issues affecting corporations?
2. What are the most salient features or elements of the internal (organisational) as well as the external (institutional) contexts, into which corporate greening is embedded in Hungary during the 90s, and which feed back upon the discourses of greening?

In order to grasp the broader, institutional context and its dynamics in more detail, the case studies themselves were designed to gain 'outsider' perspectives, along with the 'internal' ones, of the focal organisations under investigation (Eisenhardt 1989; Tsoukas 1989). The research reported here builds upon three methodological approaches: grounded theory developed originally by Glaser and Strauss (1967) and developed further by Strauss and Corbin (1990) and (1994); the case study methodology of Yin (1994); and, the elements of qualitative data analysis offered by Miles and Huberman (1994).

Seven large industrial firms, based in Hungary, were chosen as subject matters of case studies.[14] Selection rested on several different theoretical and pragmatic considerations. By the very first criterion, companies included in the sample had to be known by their environmental efforts. Thus, all the firms involved in the sample have been from among companies that were, under Hungarian circumstances, leaders in greening. This criterion stemmed right from the research question. The aim was to understand what corporate greening means to companies. This could be answered genuinely only by firms that had been making efforts in this field for a long time: only they possess detailed and rich experience.

All the seven companies in the sample are large corporations by annual sales and, except one of them, by number of employees, too. This has partly resulted from the intention to find firms for case studies that were already well known for their environmental efforts. Information about small- and medium-sized companies is relatively more difficult to access, and even in the international arena, there are very few environmental management research efforts directed to firms of this size. Experience drawn from our quantitative research experience also backed the sampling of large corporations: several classical environmental management questions and problems arise and can be examined with regard to these companies, compared to small- and medium-size firms.

Another important consideration for sampling was to choose companies that would be willing to participate relatively easily. This was a precondition for conducting successful and penetrating case studies. Experience drawn from previous conferences or seminars by listening to different corporate environmental presentations helped a lot in this process. Thus, personal acquaintance, relationship and knowledge were important aspects of selection.

Apart from these considerations, the following facets played important roles in the sampling process. In order to examine the possible impact of sector membership, companies from different sectors were needed; companies belonging to sectors usually judged to have high environmental pollution burden (chemical and cement industry) were decidedly looked for; and to have the opportunity for comparison, firms from sectors of low environmental pollution (R&D oriented companies in electronics) were also chosen.

Corporations in serious (past or present) conflicts with local communities or green organisations because of environmental problems were important to include, just as firms that have no adversarial public relations. The sample involved companies set up by green-field investments and also firms privatised through the stock exchange or by professional investors (acquisitions

[14] Out of the seven, there are two chemical, two electronic and two food companies and one firm that belongs to the non-ferrous mineral products industry.

through privatisation); there are companies in the sample with rather fragmented ownership structure and also subsidiaries of multinationals. Table 2 summarizes the ground for sampling in the present research, compared to the theoretically possible reasons summarized by Miles and Huberman (1994):

Table 2. *Sampling strategies applied* (Based on Miles – Huberman 1994: 28).

Type of sampling	*Purpose*	*Present research*
Maximum variation	Documents diverse variations and identifies important common patterns	Diversity in industrial sector, ownership structure, organisational history, environmental burden, environmental risks
Homogeneous	Focuses, reduces, simplifies, facilitates group interviewing	Large companies well-known of their environmental management efforts
Critical case	Permits logical generalization and maximum application of information to other cases	One of the firms is a frequent target of a green NGO; while two other have successfully managed conflicts with green NGOs
Confirming and disconfirming cases	Elaborating initial analysis, seeking exceptions, looking for variation	Looking for variations of corporate greening in Hungary
Intensity	Information-rich cases that manifest the phenomenon intensely, but not extremely	By doing archival research in newspaper databases first, well-publicised cases of corporate environmental management were looked for
Politically important cases	Attracts desired attention or avoids attracting undesired attention	A desire to present relatively positive examples of corporate greening
Stratified purposeful	Illustrates subgroups; facilitates comparisons	Two chemical and two electronic firms were selected
Criterion	All cases that meet some criterion; useful for quality assurance	A main precondition was to have a longer history of corporate environmental management
Combination or mixed	Triangulation, flexibility, meets multiple interests and needs	Firms sampled in previous environmental management survey research
Convenience	Save time, money, and effort, but at the expense of information and credibility	Relatively easy access through prior personal contacts

Altogether 56 interviews were conducted between February and December 2000. All the interviews were taped and then transcribed word by word. The next step was coding the texts.[15] First the most detailed and demanding coding method was used. Progressing row by row in the text, we put the most important words and expressions (either verbs, nouns, or adjectives) used by the interviewees at the end of each row as codes. Then, another coding method

[15] Each corporate case was examined profoundly by two researchers. One of them was, of course, the researcher who made the interviews, and the other was always the present author. Coding was always done by the present author, and then – in most of the cases – 'real life' field experience of the researcher was discussed and recorded. During these conversations, each researcher spoke of his/her impressions, observations about the interviewee, the place and the process of the interview itself. We also shared our views about and discussed what the interview 'seemed to be about', what we learned about the story of greening in question, and where 'dark spots', deficits, and uncertainties are with regard to its details. This way, a shared picture was formulated about each case study. Whenever four-five interviews at a company was made, a group meeting was arranged, where researchers presented their findings, initial analyses, and further research needs. Group meetings were arranged in a semi-structured way, participating researchers had to follow some instructions regarding how to present their own cases.

was applied. The main content of the rows or interview sections were marked in the text, and concepts covering their subject matters were put down on paper next to the given part. This was also made by a relatively 'thick' coding: several codes might designate each section, since more than one significant environmental issue or subject matter could have emerged.

The analysis went on as follows. The first interview was regularly made with the environmental manager of the company. One of the important tasks of the first interview(s) was to map the organisational field: persons and organisations inside and outside the company that had played some role in the history of corporate greening under investigation. That is, efforts were made to select the most important agents of corporate greening in each case. Moreover, during the first interviews (usually the first 3–4 interviews) we insisted on applying the recommendation of grounded theory to influence the interviewees with questions the least. First, general and open questions were posed in order to be able to understand gradually how they perceived the history of corporate greening, what sort of words, expressions, images they used and formulated. In the meantime, more and more questions were generated as a result of coding and analysing the interviews done already. Gradually, topics or themes of greening – mentioned by all (or most of) the interviewees or by only one of them but with a great emphasis put on it – emerged, and demanded further 'questioning' during interviews with other persons.

Certainly, the other main part of our coding (analysing) procedure was the 'combination' of the two coding methods. Furthermore, combination meant the assignation of most frequent words and expressions shown up in the sections marked by the "themes" to the "themes" themselves. Consequently, the number of themes could be decreased, and connections among them (irreducible to each other) were explored according to words, expressions used by different interviewees when speaking about different themes during the interviews. We attempted to create categories, to explore the relationship among the categories and to segregate the most important categories emerging from within the interview texts.

The next stage of interviews was conducted in a more structured way. It was designed to test initial hypotheses, explore the blank points or details of a given story of greening. Significant efforts were made to involve agents outside the focal organisation in order to reduce the possibility of uncritically accepting biased perspectives of organisational stakeholders. (Obviously, the cross checking of data gained from the interviews with company and company or other documents/websites, such as news and articles in the popular press and scientific papers, was also pursued.)

5.4 Themes of Corporate Greening

By analyzing the seven cases, different themes emerged that have a common explanatory power related to corporate greening in Hungary during the 1990s. Below, it is shown very briefly how themes representing different social domains of analysis make their contributions to understanding the research question. First, the domain of social structures and its different impacts upon, or resources provided for, corporate greening is introduced. Two macro-structural themes dominate this discussion, namely, those of socio-political regime change and privatization (in a sense, an economic regime change). Also, the context of organizational politics is presented here in order to account for the more extant structural context of corporate greening, on the one hand, and demonstrate some constraining factors within today's bureaucratic organizations that, in some circumstances, bear heavily upon processes of greening.

Secondly, themes of the individual and intersubjective level of corporate greening will be presented in order to shed some light upon the agency and interaction dynamics of the phenomena under investigation. The role of leadership and environmental managers, as well as their connections, will be touched upon.

Third, themes representing different but connected legitimacy discourses will be outlined that are applied as resources in, as well as constitutive of, particular processes and directions of corporate greening in Hungary during the 1990s. These themes clearly intersects the domains of social structure and the intersubjective 'interaction order' since they represent important resources for both. Three legitimacy discourses will be outlined, the one emphasizing a sort of (re-)civilizatory process, 'becoming European', a second one equating the 'modern' with environmental soundness, and a third one expressing the force of the ideology of 'free market environmentalism'. Finally, it will be argued that these legitimacy discourses are embracing a particular ordering of social reality that can be termed 'ecological modernization'.

5.4.1 Social Contexts and Resources in Corporate Greening

5.4.1.1 Changes in Macro-Structures

REGIME CHANGE – The socio-political regime change from an authoritarian-socialist arrangement towards a free market society has its heavy bearing upon the processes of corporate greening in Hungary during the 1990s. First of all, it should be emphasized that environmental issues were in the forefront in these years. While during the previous regime issues of ecology were politi-

cally suppressed or mainly relegated to the table of different experts (particularly medical professionals), the melting of the dominating authoritarian political structures had provided space for expressing the voice of ecology, while, at the same time, this expression in its primarily political manifestation contributed to the socio-political change. The symbolic representation of the emerging power of ecology was the enormous popular protest against the Bős-Gabcikovo dam on the Danube River. Ecology were high on the agenda in a profoundly politicized manner, uniting for a while all dissenting political voices from liberals through conservatives to social democrats against a not unusual water engineering endeavour that symbolized at that time the unconstrained and irrational power of authoritarianism.

Clearly, the emerging democratic arrangements has extensively, irreversibly and quite quickly changed the playing field for economic actors, including large corporations as well. The relation and balance, as well as nature, of power between the economy and society, between corporations and local communities have changed. Due to the enacted and enforced negative civil rights and freedoms, the emerging civil society and its organizations were able to put pressure on previously overwhelmingly dominating business corporations to stop externalizing some of the costs of their manifestly dangerous, environmentally uncaring, activities. The free press were constitutive of this situation, and reports of environmental evils and misconducts pursued by large companies were abound. Business corporations, at this time still mainly state-owned, were immediately find themselves in the pressing circumstances of widespread public mistrust – in a legitimacy vacuum. (cp Vári – Caddy 1999)

Nevertheless, specific cases of corporate greening were different according to the extant social/local setting – the past once again made its impact. During the previous regime local politics and corporate management were intermingled, many corporate cadres residing in political positions in local governments. Moreover, economically many settlements were exclusively attached to, and consequently dependent upon, one or a few large companies due to the form and logic of planned industrialization in countrywide. The most extreme situation was that of the so-called socialist towns, built up from small villages through extensive industrialization (cp Szirmai 1999). These cases are similar to ’company towns’ where the town and the factory have started to being built at the same time, producing also tight-coupling in technical-infrastructural and social-political terms as well. The latter is not only exemplified by the company cadres occupying local political positions but the local population being overwhelmingly the employee of the factory in question.

> *“The town was started to be built at the same time as [name of company]. There were times when [name of company] itself served as a public utility, too. When the plant was being located here in the beginning of the 60s, the construction of public utility services was started, at the very*

beginning with a wastewater utility. The firm has treated waste water from the very beginning of its operations; first, municipal waste water streams were treated, then industrial waste water, too." (Environmental manager, petrochemical company)

These sometimes 'symbiotic' connections had their differing mark on processes of greening. Typically, corporations located in the edges of previous socialist company towns was not confronting with radically growing environmental pressure by local population and civil organizations, as opposed to large polluting business firms which were located in settlements that had a previous (before World War II) civil history. The past history of a civic culture seemed to make a significant difference with regard to processes of corporate greening through the emergent and powerful civil actions and subsequently organizations as one of our case companies demonstrates (see also Szirmai 1999). Despite its continuing economic and consequent political strength, the managers of the cement factory were confronted with a "*spontaneously growing environmental discontent and movement in town*"'. Obviously, the situation was influenced by the nature of environmental pollution as well:

"… the entire townscape looked like an industrial plant ... the cement plant ejected dust all over the town ... cement dust deposited on parking automobiles ... and it could only be removed by chemicals." (Environmental officer at local government)

Nevertheless, especially during the early years of regime change politics were again in the forefront but in a different constellation. Local communities and organizations were empowered, as compared to corporations, even to the extent that radical, grassroots environmental was supported by local politics:

"We had civil actions such as the washing of cement trucks … We blocked the gates of the cement factory and let only those loaded trucks out which were washed inside ... police were on our side during these actions, and a policeman was always standing there with us so as to prevent the truck drivers from chasing us away with a steel wheel-loosener …" (President of Committee for Urban Development and Environmental Protection at local government)

Therefore, corporate greening was overwhelmingly understood as an inevitable strategic step or process in order to regain or rebuild credibility and trust on the part of local communities and society at large. In this sense, technological-operational as well as managerial steps were given immediate political meaning as one of the executive managers explains carefully:

"These are indeed not unnecessary investments [technological reconstruction], and these should be implemented with the greatest commitment and effectiveness, so as our activities to be accepted by our environment; and to be increasingly felt that we really want to change them [i.e., operations]. It is in our best interest, too … It works by the principle of putting together the large and small steps one takes. … If it is not put together in such a way it is not credible and, without it, all the other

economic objectives can hardly be achieved … We will be more credible in our environment, we will be more credible in the eyes of our partners and this will suggest to our customers that the products we offer can safely be used …" (CEO, cement factory)

Furthermore, distrust and lack of credibility were not only prevalent in the 'outside' social setting but within corporate hierarchies as well. Typically, large state-owned companies were not only balancing at the edge of bankruptcy in standard financial terms but were characterized by internal mistrust and dishonesty, particularly with regard to environmental performance.

"… it was a heavily indebted company at that time, facing a harsh financial situation. … The firm was demoralized throughout. During the last years of socialism, the changes could be sensed and a number of managers were not taking care of their duties anymore." (CEO, chemical firm)

PRIVATIZATION – Privatization, through different phases and different methods and many times publicly heavily contested, has resulted in the acquisition of large Hungarian companies by foreign owners.[16] The new owner has brought additional resources and/or new management attitude and practice, and ultimately survival for many large industrial firms. Providing financial resources for corporate greening (e. g. technological restructuring) constituted a contribution by foreign owners at least to the extent that enabled the cleaning up of past environmental burdens. This was clearly motivated by shorter term financial interests of the new owners in the sense of reducing financial risks emerging from bad environmental performance and reputation. In other instances, in order to be able to be privatized through the stock market, huge environmental investments and establishment of environmental management systems were straightforwardly needed (financed by central government funds as a re-organisation before privatization).[17]

"If we did not take due care of our environmental issues, it would have been much more difficult to go to stock market. It was a must to make the environmental state-of-affairs at the chemical company transparent …" (SBU director, chemical firm)

As opposed to financial investors, privatization in the form of acquisition by a foreign firm with similar business profile in a sense has resulted in more active environmental involvement. In these cases, owners typically force an institutionalization of some form and extent of stakeholder dialogue and involvement. They are primarily motivated by gaining a good corporate citi-

[16] Hungary, as opposed to most of the former socialist contries, has chosen the path of so-called 'spontaneous privatization' which were, despite any claims for efficiency and effectiveness, obviously dominated by managers, previous political cadres and some of the government officials who held information monopoly over relevant issues and opportunities.

[17] Note, however, that improvements in corporate environmental performance due to privatisation are by no means an intended result of well-designed processes and methods of privatisation in Hungary. In fact, as Csanádi and Páczi (1998) and Csanádi (n. d.) point out, environmental concerns were deliberately supressed by Hungarian state privatization agencies in favour of gaining more financial revenues in the short run, partly to finance the country's huge foreign debt payments.

zen position within the local community and society at large. In order to achieve it, they employed subtle political tactics as well, such as financing professional visits of groups of local politicians as well as representatives of civil organizations to be able to declare and build constituency around their good environmental behaviour in the new social context.

5.4.1.2 Struggle for Control: Organizational Politics of Greening

While the discussion relating to the social setting of corporate greening in Hungary during the 1990s was intended to point out the 'enabling dynamics' of and the resulting social resources provided by the ensuing macro-structural change, in the present section some constraint to greening will be introduced. The constraints presented here are to do with the internal social setting of corporations, namely, the hierarchical nature of corporate bureaucracies and the constant struggle for internal control/resources among different functional areas, as well as their representatives, of standard business operations.

Not one of the case companies has elevated the representative of the environmental management function to the level of top management. In some of the cases that can be due to the fact that one of the executives her/himself fill the environmental function at the top, both as a leader and a manager. However, most of the cases demonstrated a subtle though important power struggle around the hierarchical position of the environmental function. It is of interest to literally cite the top managers of one case companies in order to grasp the hidden tensions.

> *"His environmental manager status and position is … how can I say … [name of company] is not such an hierarchical company. The job of the environmental manager is very important. … There is no need for it [having an environmental director]. The name of the position someone has doesn't matter at all, does it?" (Director of marketing communication, petrochemical firm)*
>
> *"The environmental manager … you can call him environmental director, too, if you like but it would not mean a bigger authority and prestige for him." (Director of strategy, petrochemical firm)*

Contrast it with the words of the environmental manager:

> *"We have not been successful in struggling for it. The reason could be that anyway things are going fine at [name of company]." (Environmental manager, petrochemical firm)*

Lost power struggles may result even after institutionalizing the environmental function in a more integrated fashion as well, as the case of the petrochemical firms clearly underscores. This company, during the second half of the 90s, gradually developed a new business unit and a separate environmental R+D unit around a patented invention of treating mixed plastic wastes. After a

hostile acquisition of another chemical firm, the new board of directors radically changed strategic directions divesting the environmental technology business unit as well as laying off its newly elected director altogether with the environmental R+D unit. The business rationale of these decisions were literally phrased that 'an elephant does not go dancing with a plea' (that is, the country's largest petrochemical unit does not fit with an emerging and uncertain environmental business).

Environmental management standards (such as ISO 14001 or EMAS) are enthusiastically promoted by the corporate management literature. Much less discussion, however, surrounds their potential as 'communicative actions', or their fashionableness resulting from imitative behaviour institutionalizing these standards within organizational fields. Our case studies revealed environmental management systems (EMS) as power resources for organizational stakeholders. The administrative logic of an EMS once institutionalized enhances the bureaucratic control of the business function, and its representatives, charged with its day-to-day operation throughout the organization.

Since environmental managers reside typically in less influential organizational positions (e.g. in staff position or in middle-management), organizational power relations may pose critical problems to them. Many environmental managers argued that the introduction of an EMS has increased or broadened their range of influence. Institutionalizing an EMS within the organization makes environmental tasks systematic and routine-like, forces all employees to take environmental concerns into account to some extent. The principle of continuous improvement included in an EMS provides a rationale for arguing for more environmental efforts implemented over time. However, the actual process of implementing an EMS creates specific organisational conflicts or tensions between representatives of quality management and those of environmental management. Since quality assurance standards were typically institutionalised before EMS, quality departments have usually more organisational power and influence than their environmental counterparts. By implication, when debates arise whether to implement either an integrated quality and environmental management system (Q/EMS) or separate systems, representatives of environmental interests find themselves in a weaker position compared to those of quality issues. It is not at all unusual that the quality assurance department directs the process of implementation of an EMS, as well as the day-to-day management of the integrated system. All these processes are full of possible and actual conflicts, resulting at worst in the total subversion of environmental concerns and resources to quality assurance interests.[18]

[18] As it has happened with one of our case companies, the food products firm, where the entire environmental unit was eliminated and the environmental manager has been put under the direction of the quality assurance manager.

Another aspect of the weak power position of the environmental function within corporations has to do with the main raison d'etre of business, that is, profit. The ideas of consumer satisfaction, market survival and profit expectations all strengthen the position of quality function vis-à-vis the environmental one:

> *"There is obviously a reason, namely the consideration of profits, which is a main aim of a company like this. It is easier to be devoted to quality of production, as there is a direct link there between quality and profits. In the eyes of senior managers environmental issues and considerations mean costs, not profits … they are not viewed as profitable … senior management thinks rationally [in the sense of profit making], hence it is difficult for them to be dedicated to environmental issues, much more so than to quality assurance issues." (Quality Manager, food corp.)*

5.4.2 Individuals and Their Interactions in Corporate Greening

LEADERSHIP – The role of a leader, who resides in the upper echelons, seems to be of primary significance in processes of corporate greening, particularly when greening is enacted at a time of discontinuous organizational change. As it was previously referred to, political regime change, along with the ongoing socio-economic changes, in Hungary put many firms in a crisis situation: declining market shares resulting from outdated technologies and product lines and import competition; collapsing Eastern (COMECON) markets; lack of financial resources following a sharp decline in state financing or subsidies; legitimacy deficits in local communities. Therefore, greening was typically emerged as part of a broader organizational crisis. To find a way out for formerly state-owned, large corporations in an emerging market economy, transformative leadership seemed to be essential at top management level. In most of our case companies an executive or more were perceived to act as a leader with regard to environmental issues as well. In order to overcome the organizational crisis, leaders typically face the complex task to regain public trust and, at the same time, reduce uncertainty and conflicts within the organization in question and, eventually, establish a more co-operative organizational climate:

> *"I met all the engineers … but the first half a year at the company was devoted to [assure them] that they can be honest, there will be no harm to anyone. I explained that the whole thing is happening so as to improve on all things. It took about a year to make the engineers of business units be open and write down what they see to be wrong and how they see it is possible to change it." (CEO, chemical firm)*
>
> *"We met the experts, technicians, plant engineers, and managers of business units and … in fact we had to establish a common language … A process started at the company that we called truth-telling. Reality*

should have been uncovered honestly because we had to solve the problems …" (SBU Director, chemical firm)

Thus, a leader's role is someone's who is able to build up from the scratches not only a well-functioning organization in operational terms but in social-interactional terms. S/he might almost be considered as a 'trouble-maker' but s/he is clearly characterized by specific personal features:

"… And a gentleman arrived here who is a 'green man' … who immediately wanted to realize a number of things here that he had previously seen all around the world. … [He was] a man who took enormous steps in demolishing polluted buildings and gave week long or ten days long deadlines for handling toxic wastes … He was a man of credibility. Of course, it couldn't happen differently anyway since no one follows an unreliable person …" (Engineering Director, electric equipment manufacturing firm)

From the perspective of organizational greening, it is not necessary that the leader her/himself initiates the processes of greening, though it seems to be important that s/he develops a general programme for organisational change and demonstrates a commitment whereby greening efforts from the lower echelons are supported and encouraged. Our case studies suggest that a leader can succeed with greening without other 'change agents' at lower echelons, but 'green change agents' typically at middle management levels seems to easily loose success in their greening efforts unless at least one leader back her/him up. Some of the cases examined demonstrated that, for example, after the leader's leaving the organization greening has been 'frozen' at the level reached, and new initiatives of the green champion (even as an environmental manager) are no longer welcomed or supported. It might be said, as the case study of the food product company has profoundly demonstrated, if managers replace leaders, the 'interactional order' will also change. Managers are more concerned with the already established market positions and the ensuing fierce struggle for market share; therefore they tend to concentrate upon the cost structure and short-term profit gain. Short-term market goals might easily subvert longer-term nonmarket ones; environmental initiatives should compete with other projects on a very narrow cost-benefit calculus – they are predestined to loose. Environmental initiatives ahead of market rivals and perceived immediate stakeholder pressure are not supported; the environmental function is consequently arranged, bureaucratized, routinized and reduced to a cost-effective rationality.

ENVIRONMENTAL MANAGER AS AGITATOR AND MEDIATOR – No corporation among the case companies provides a senior position in top management for environmental affairs. Corporate environmental officers tend to be either in staff position directly reporting to one of the directors (or executives) or in a middle management rank. Thus, they characteristically function in a 'buffer zone' from where they struggle for transferring environmental ideas, or

awareness, to the top, as well as to the lower levels of organisational echelons. They are, at the same time, facilitators, agitators, and influencers who have to develop excellent communication skills to succeed in their day-to-day jobs and overcome organizational resistance arising typically from short-run cost minimization and profit maximization concerns. Corporate environmental officers struggle to construct a legitimate discourse about environmental issues that are essentially public affairs, within a private institution – a task unavoidably full of contradictions.

> *"The environmental protection [unit] is a mediator – it mediates those tasks that business units should dealt with technically or otherwise. ... To accomplish it, very good human skills, persuasiveness and an ability to communicate are needed. Top management should be persuaded about the importance [of environmental issues] because it requires a lot of money. Then, one should also persuade those who will eventually carry out the tasks. To assign tasks for others is not happily accepted in any community, is it? There should be an intention to do it but they should be persuaded about the necessity of those [environmental] steps." (Environmental Manager, chemical firm)*
>
> *"… I have to develop very sophisticated small strategies … when, what, how, whom, and why I tell something … Sometimes I make mistakes." (Environmental and Quality Manager, electronics firm)*

Personal political skills seemed to be needed not only for internal power games but to effectively accomplish assigned 'boundary spanning' activities. Environmental managers are at the border of their own organizations, thereby typically acting in a dynamic stakeholder context: keeping in touch with street-level environmental regulators, green NGOs, and local people; exposed to the possible tensions between those different but legitimate stakeholder interests. Corporate environmental officers thus experience their professional life as a constant struggle.

How personal characteristics or life histories come into the picture of organizational greening might be exemplified by short stories of two environmental managers. One of them is employed by a multinational food corporation that invested in Hungary in a green-field site at the dawn of the regime change. Yet, the first official ceremony of this green-field investment was burdened by a loud protest by so-called 'green radicals' who opposed the ideology of a 'throwaway-society' they claim are embodied in the very product of the corporation. Therefore, from the very beginning the role of the environmental manager is one of buffering and protecting the company's core from environmental charges. It is by no accident that she is at the same time the PR manager for the firm. This story of greening is paradox in every detail, notwithstanding the person who occupies the environmental manager position. She is perceived to deliberately act in an environmentally conscious way in her private life; had and still has a mission to work for a public cause,

respected even by 'radical green opponents' of the company; though she believes the potentially positive power of business to implement a sustainable society.

> *"… from within [the company] it is possible to do more for the environment than working for the environmental movement… there is money here for it. If the money will be spent carefully and thoughtfully here, then it is possible to take preventative actions, not only end-of-pipe ones… It is possible to do this job very correctly and well, in a way which also corresponds to the economic policy of the firm." (Environmental Manager, food corp.)*

Clearly, the company top management seems to acquire together with her as an employee all the external respect of a 'green image' and expertise she has accumulated, meanwhile carefully separating her in the organizational hierarchy by assigning all internal environmental efforts to other functions and persons, basically closing the possibility for her ideas and skills penetrating the corporation.

The other personal life history relevant to organizational greening related to the other food products company. Due to the relatively enduring crisis situation, even well after the regime change, at the food products company, and after a finally successful, but compared to domestic competitors a relatively late, privatization, the basic operations and management have been renewed. Emerging from this 'reconstruction' were an environmental manager position and an environmental department (with extended laboratory facilities and expertise). The position was built up and subsequently occupied by a woman coming from one of the lowest positions of the former corporate hierarchy. Her enthusiasm for the green cause and her ability and drive for gaining new knowledge and expertise were all widely appreciated by the leaders of the company during the reconstruction, as well as by the outside environmental expert community. According to her, the enthusiasm and drive for learning and dwelling into environmental sciences has a lot to do with her restricted opportunities for studying in the previous authoritarian regime due to her parents' social background. Her efforts supported by the 'change executives' of the company and her ability to convert others to the green cause resulted in the company's being the first in building up an EMS among all the subsidiaries of the multinational mother firm, as well as among all Hungarian food companies.

Clearly, personal life histories enter the scene of organizational greening, intersecting with the 'interaction order' and being interdependent by the social setting (macro-structure) and the different resources provided. In the next section, we turn to the legitimizing discourses emerged as dominating the stories of corporate greening in Hungary during the 1990s.

5.4.3 Catching Up Ecological Modernization: Legitimizing Discourses in Corporate Greening

BECOMING EUROPEAN – The EU-focus in political discourses in Hungary has its impact upon the interpretations of corporate greening, as it is reflected by the texts of interviews conducted. References to the regulations, norms, practice, and awareness in the EU serve a point of comparison, as well as a source of legitimacy.

> *"These are all … technologies that have stood the test of time and come from West European, developed countries …" (Director of Strategy, petrochemical firm)*
>
> *"The technologies operated here are above all designed to be environmentally sound. … We operate western European, American and Japanese technologies." (Director of Marketing Communication, petrochemical firm)*

A number of interviewees spoke of greening as a process of becoming more 'civilized', or of accessing 'the developed and modern West'. The EU and other developed countries are considered to be the ideals, both technologically and culturally. In this sense, processes of greening amount to the import and application of environmentally sound technologies, as well as a cultural transfer from the West. Hungary eventually seemed to be joining Europe, the civilized and developed world again, an appealing rationale for corporate greening:

> *"I think the pace of development has passed all around. As the quality of our life has changed in many respects ... the factory itself and its environment have changed in this [i.e., environmental] field to the same extent ... this is [a process of] becoming European. We try to set those standards to us and to our environment in every area of life that is necessary and important for a more civilised way of life." (PR Manager, cement factory)*

Some even claimed that, while Hungary is only preparing for joining the EU, his company has, in fact, complies with the relevant EU requirements:

> *'We are now in compliance with current legislation in the European Union. … just like we are part of the European Union. … The [name of company] could indeed join the EU tomorrow.' (environmental manager, petrochemical firm)*

BEING MODERN – Another widely applied discursive pattern emerged from the interviews was the identification of 'modern' with environmentally sound in terms of both technology and culture (awareness). An up-to-date technical solution or technology is argued to be, at the same time, environmentally more friendly than its previously applied counterparts. Modern technology is argued to be necessarily producing better environmental performance. By implication, technological modernisation does typically provide the much loved 'win–win'

outcomes: improving competitiveness and environmental quality at the same time.

Similarly, a modern organisational, hence corporate, culture cannot almost be imagined without environmental awareness. As modern technology is becoming cleaner than the one previously applied, modern organisational men are growing an environmental consciousness that was not at all typical in the past – so the argument goes. Modern organisational men are said to be 'aware', 'disciplined', and 'taking due care of' the tidiness of their environment. Modern technology needs modern men in order to proceed further on the road of modernisation – this time, though, on the road of ecological modernization. Ecological modernization seems to be a natural extension of the developmental thinking of modernity. Further, or more and more modernization, with regard to both technology and culture, will, it seems to be suggested, automatically solve ecological problems.

FREE MARKET ENVIRONMENTALISM – Three major logics of modern social organization are the market, the bureaucracy, and the community (or civic logic). The role of them with regard to corporate greening is also evident and expressed by the interviewees, though the importance attributed to each of them greatly differs. 'Free market environmentalism' is chosen here to underline the dominance of the logic of the market as an institutional frame to be applied to making sense of ecological issues. Many discursive patterns revealed this dominant frame. For example, a well-functioning economy is advocated as a fundamental condition for providing resources for environmental protection. Environmental management, both at an organisational and societal level, can only be pursued at or beyond higher levels of economic development. Relatedly, environmental protection is better to treat the 'laws of the market' as given and attempt to capture the dynamics of free markets in favour of conservation or preservation interests. Free markets might serve the interests of ecology – as the argument goes – if the rules of the market game are properly set. This leads to the well-known argument for internalising externalities, that is, eliminating price distortions due to unaccounted pollution costs. However, if all costs are reflected in market prices, free markets will automatically produce an eco-efficient economy that proceeds on a green growth path.

> *"… the self-determining laws of the [market] economy will, sooner or later, eliminate wrong packaging decisions, though there are … problems of over-packaging." (Secretary General, food industry association)*

At the post-consumption phase, the crucial issue is accordingly:

> *"… how much expenditure is needed for directing materials back to the circulation of products?" (Secretary General, food industry association)*

The optimal packaging solution will be achieved

> *"… [i]f these [environmental expenditures] are internalized in product prices, then it will in fact automatically go in the direction that price and cost conditions will determine which [packaging] solution will be applied." (Secretary General, Food Industry Association)*

The task of integrating environmental considerations into the rules of the game is obviously assigned to the government sector. Environmental legislation and regulation is justified to the extent of internalizing pollution related externalities in ways that do not hurt business competitiveness. The bureaucratic logic has, therefore, its special role to play but clearly within the dominant frame set by the free market logic of social order.

The synthesis between profit and environmental protection constitute a common theme for executives interviewed when speaking about sustainable development:

> *"The ideal environmental project, at least in our field of business activity, I think, besides that it benefits the natural environment, produces profits, too." (Director of strategy, petrochemical firm)*
>
> *"The most important thing is profit. It is even true if I think it does not hurt environmental features because it is a taken-for-granted thing. … You cannot separate the two. Speaking about sustainable development does not only mean that environmental quality should be sustained but economic development should be sustained, too." (Environmental manager, petrochemical firm)*

Sustainable development is understood not as a shift away from the growth paradigm but a claim for 'green growth'. The productivism and consumerism of the prevailing social order is, thus, not called into question.

5.5 Closing Reflections

The first substantive part of the paper developed a theoretical typology in order to clarify the assumptions and analytical structures of the different theoretical interpretations of greening. The aim was to make the first steps to clarify the underlying social theories of organizational greening. The paper argued for a critical realist perspective that works with a stratified ontology in order to preserve the subtle richness and inherent ambiguity in social reality.

Note however that the typology presented above is not complete in every respect. It may be argued that the organisational crisis management literature provides a particular understanding of corporate greening that should be dealt with separately. Moreover, particularly reflecting upon the debates between so-called anthropocentric versus ecocentric prescriptions of greening, a separate and important line of research has emerged which employs a theoretical perspective informed by and rooted in the rich tradition of feminist social sciences. A feminist perspective has a clear relation to the interpretation of

organisational greening as a political-economic change since both approach focus upon power relations and the 'logic of domination' prevailing in the discourses and practices of organisational greening (see Meriläinen 1998). It might be further argued that a 'Third-world' (or 'indigenous') perspective on organisational greening in particular and on sustainable development in general has been emerging and informing related discussions by pointing out some of the ethnocentric tenets of the dominant discourses and practices of greening (see Banerjee 1999a and 1999b). An important research task for the future is to integrate these perspectives with the typology presented above, or re-assess the typology of corporate greening in light of these different lines of reasoning.

The qualitative research reported above intended to shed some light on the operating dynamics of corporate greening and the opportunities as well as the inherent limits, as a consequence of the dynamic interrelatedness or intersections of different social domains. Moreover, the paradigm of ecological modernization emerged as the discursive frame of reference legitimizing efforts to green corporations. Ecological modernization calls for as well as promises a huge improvement in eco-efficiency of production and business operations, a development and expansion of future markets for green products and services for the environmentally conscious and demanding consumers, and a synergy between the industrial/business culture and ecology.

The driving force of ecological modernization can be the bureaucratic corporation. Corporations are claimed to possess the financial, organizational, and human resources needed for implementing any change on a relatively larger scale. Up-to-date technology is operated by a highly skilled and disciplined workforce. The instrumental rationality embedded in bureaucratic organizational structures and routines are claimed to be directed toward the objectives of making ecology economically efficient and competitive.

Clearly, ecological modernization requires the speeding up the co-operation between the bureaucracy of modern science (scientific institutes) and that of the economy (corporations), while supported by bureaucratic organizations of the political arena. The idea of progress, the authority of science and technology – essential features of modernity (see Redclift 1993) – are not given up, indeed they are further reinforced, this time, in the name of ecology. However, one should be aware of the very dark side of the modern order. As Zygmunt Bauman forcefully argued in his thorough and provocative analysis of the Holocaust committed by the Natzis against Jewish population in Europe, the rational world of modern civilization has made the Holocaust thinkable and, tragically, realizable (Bauman 1989). The machine of destruction set in motion by the Natzis was operated and accomplished by the predictably rational routines of bureaucratic organizations and with industrial efficiency. In other

words, the instrumental rationality of modern science, technology, and organizing tend to avoid, neglect, or even eliminate discourses about power, the dangers of dominating knowledge, as well as ethics and emotions. In this sense, it may risk to contribute to the realization of a 'brave new world' ruled by an elite obsessed with the idea of material progress and instrumental rationality.

References

Alvesson, Mats – Willmott, Hugh (1992) *Critical Management Studies*. Sage: London.

Bandura, Albert (1991) Social cognitive theory of thought and action. In: *Handbook of Moral Behaviour and Development. Vol. I: Theory*, ed. by W. M. Kurtines – J.L. Gewirtz, 45–103. Laurence Erlbaum Associates: Hillsdale, NJ.

Banerjee, Subhabrata Bobby (1998) Corporate environmentalism: perspectives from organizational learning. *Management Learning*, 29 (2): 147–164.

Banerjee, Subhabrata Bobby (1999a) Sustainable development and the reinvention of nature. Paper presented at the Critical Management Studies Conference, Manchester, UK, July 14–16, 1999.

Banerjee, Subhabrata Bobby (1999b) Whose mine is it anyway? National interest, indigenous stakeholders and colonial discourses: The case of the Jabiluka uranium mine. Paper presented at the Critical Management Studies Conference, Manchester, UK, July 14–16, 1999.

Baron, David P. (1995) Integrated strategy: market and nonmarket components. *California Management Review*, 37 (2): 47–65.

Bauman, Zygmunt (1989) *Modernity and the Holocaust*. Polity Press and Basil Blackwell: Oxford.

Bourdieu, Pierre (1977) *Outline of a Theory of Action*. Cambridge University Press: Cambridge.

Crane, Andrew (1995) Rhetoric and reality in the greening of organisational culture. *Greener Management International,* 12: 50–62.

Crane, A. (1997) The dynamics of marketing ethical products: a cultural perspective. *Journal of Marketing Management*, 13: 561–577.

Crane, A. (2000) Corporate greening as amoralization. *Organization Studies*, 21 (4): 673–696.

Csanádi Mária (n.d.) *Környezetvédelmi garanciák a privatizációban*. Budapest: ÁPV Rt.

Csanádi M., Páczi, Erzsébet (1998) Környezetvédelem a privatizáció közegében. *Közgazdasági Szemle*, XLV (1): 51–68.

Dechant, Kathleen – Altman, Barbara (1994) Environmental leadership: from compliance to competitive advantage. *Academy of Management Executive*, 8 (3): 7–20.

Dodge, John (1997) Reassessing culture and strategy: environmental improvement, structure, leadership and control. In: *Corporate Environmental Management 2: Culture and Organisations,* ed. by R. Welford, 104–126 Earthscan: London.

Dosi, Giovanni (1988) The nature of the innovative process. In: *Technical Change and Economic Theory*, ed. by G. Dosi – C. Freeman – R. Nelson – G. Silverberg – L. Soete, 221–238. Pinter: London, New York.

Eisenhardt, Kathleen M. (1989) Building theories from case study research. *Academy of Management Review*, 14 (4): 532–550.

Elkington, John (1994) Towards the sustainable corporation: win-win-win business strategies for sustainable development. *California Management Review*, Winter: 90–100.

Fineman, Stephen (1996) Emotional subtexts in corporate greening. *Organization Studies*, 17 (3): 479–500.

Fineman, S. (1997) Constructing the green manager. *British Journal of Management*, 8: 31–38.

Fineman, Stephen – Clarke, Ken (1996) Green stakeholders: industry interpretations and response. *Journal of Management Studies*, 33 (6): 715–730.

Giddens, Anthony (1984) *The Constitution of Society: Outline of the Theory of Structuration*. Polity Press: Cambridge.

Gladwin, Thomas N. (1993) The meaning of greening: a plea for organisational theory. In: *Green Strategies for Industry,* ed. by K. Fischer – J. Schot, 37–62. Island Press: Washington, D.C.

Glaser, Bernard, Strauss, A. (1967) *The Discovery of Grounded Theory*. Aldine: Chicago.

Green, Kenneth – Miles, Ian (1996) A clean break? From corporate R&D to sustainable technological regimes. In: *The Earthscan Reader in Business and the Environment*, ed. by R. Welford – R. Starkey, 129–144. Earthscan: London.

Greenwood, Royston – Hinings, C. R. (1996) Understanding radical organizational change: Bringing together the old and the new institutionalism. *Academy of Management Review*, 21 (4): 1022–1054.

Halme, Minna (1997) Developing an environmental culture through organizational change and learning. In: *Corporate Environmental Management 2: Culture and Organisations,* ed. by R. Welford, 79–103. Earthscan: London.

Halme, Minna (1996) Shifting environmental management paradigms in two Finnish paper facilities: a broader view of institutional theory. *Business Strategy and the Environment*, 5: 94–105.

Hart, Stuart L. (1995) A natural-resource-based view of the firm. *Academy of Management Review*, 20 (4): 986–1014.

Hass, Julie L. (1996) Environmental (green) management typologies: An evaluation, operationalization and empirical development. *Business Strategy and the Environment*, 5 (2): 59–68.

Hoffman, Andrew J. (1999) Institutional evolution and change: environmentalism and the US chemical industry. *Academy of Management Journal*, 42 (4): 351–371.

Hoffman, Andrew J. (2001) Linking organizational and field-level analysis: the diffusion of corporate environmental practice. *Organization & Environment*, 14 (2): 133–156.

Jones, David – Welford, Richard (1997) Culture change, pluralism, participation. In: *Corporate Environmental Management 2: Culture and Organisation,* ed. by R. Welford, 127–151. Earthscan: London.

Kemp, René – Schot, Johan – Hoogma, Remco (1998) Regime shifts to sustainability through processes of niche formation: The approach of strategic niche management. *Technology Analysis and Strategic Management*, 10 (2): 175–195.

Layder, Derek (1997) *Modrn Social Theory: Key Debates and New Directions*. UCL Press: London.

Levy, David L. – Rothenberg, Sandra (1999) Corporate strategy and climate change: heterogeneity and change in the global automobile industry. *ENRP Discussion Paper E–99–13*. Kennedy School of Government, Harvard University.

Maxwell, James – Rothenberg, Sandra – Briscoe, Forest L. – Marcus, Alfred (1997) Green schemes: corporate environmental strategies and their implementation. *California Management Review*, 39 (3): 118–134.

Mayhew, Nick (1997) Fading to grey: the use and abuse of corporate executives' representational power. In: *Hijacking Environmentalism: Corporate Responses to Sustainable Development*, ed. by R. Welford, 63–95. Earthscan: London.

Meriläinen, Susan (1998) Non-hierarchical organizations: permitting differences and eliminating practices of exclusion. Paper presented at the 14th EGOS colloquium, July 9–11, 1998, Maastricht.

Miles, Matthew B. – Huberman, A. Michael (1994) *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd edition, Sage: Thousand Oaks CA, London, New Delhi.

Mouzelis, Nicos (2000) The subjectivist–objectivist divide: against transcendence. *Sociology*, 34 (4): 741–762.

Newman, John C. – Breeden, Kay M. (1992) Managing in the environmental era: lessons from environmental leaders. *The Columbia Journal of World Business*, Fall–Winter: 210–221.

Newton, Tim J. (2002) Creating the new ecological order? Elias and actor-network theory. *Academy of Management Review*, 27 (4): 523–540.

Newton, T. – Harte, George (1997) Green business: technicist kitsch? *Journal of Management Studies*, 34 (1): 75–98.

Orssatto, Renato J. – Clegg, Stewart R. (1999) The political ecology of organizations. *Organization & Environment*, 12 (3): 263–279.

Orsato, Renato J. – den Hond, Frank – Clegg, Stewart R. (2002) The political ecology of automobile recycling in Europe. *Organization Studies*, 23 (4): 639–665.

Post, James E. – Altman, Barbara W. (1994) Managing the environmental change process: barriers and opportunities. *Journal of Organisational Change Management*, 7 (4): 64–81.

Purser, Robert – Park, C., Montuori, A. (1995) Limits to anthropocentrism: toward an ecocentric organisation paradigm? *Academy of Management Review,* 20 (4): 1053–1089.

Räsänen, Keijo – Meriläinen, Susan – Lovio, Raimo (1995) Pioneering descriptions of corporate greening: Notes and doubts on the emerging discussion. *Business Strategy and the Environment*, 3 (4): 9–16.

Redclift, Michael (1993) Sustainable development: needs, values, rights. *Environmental Values*, 2: 3–20.

Reed, Michael I. (1997) In praise of duality and dualism: rethinking agency and structure in organizational analysis. *Organization Studies*, 18(1): 21–42.

Reed, M. I. (1996) Organizational theorizing: a historically contested terrain. In: *Handbook of Organizational Studies*, ed. by S.R. Clegg – C. Hardy – W.R. Nord, 31–56. Sage: London.

Reinhardt, Forest L. (1998) Environmental product differentiation: implications for corporate strategy. *California Management Review*, 40 (4): 43–73.

Roome, Nigel (1992) Developing environmental management strategies. *Business Strategy and the Environment*, 1 (1): 11–24.

Schot, Johan (1992) Credibility and markets as greening forces for the chemical industry. *Business Strategy and the Environment*, 1 (1): 35–44.

Shrivastava, Paul (1995) Environmental technologies and competitive advantage. *Strategic Management Journal*, 16 (Special Issue): 183–200.

Shrivastava, P. (1991) Castrated environment: greening organizational science. *Organization Studies*, 15: 705–726.

Simmons, Peter, Wynne, Brian (1993) Responsible Care: trust, credibility, and environmental management. In: *Green Strategies for Industry*, ed. by K. Fischer – J. Schot, 201–225. Island Press: Washington, D.

Starik, Mark – Throop, Gary M. – Doody, John R. – Joyce, Mary Ellen (1996) Growing an environmental strategy. *Business Strategy and the Environment*, 5 (1): 12–21.

Stead, Edward W. – Stead, J. G. (1994) Can humankind change the economic myth? Paradigm shifts necessary for ecologically sustainable business. *Journal of Organizational Change Management*, 7 (4): 15–31.

Steger, Ulrich (1993) The greening of the board room: how German companies are dealing with environmental issues. In: *Green Strategies for Industry*, ed. by K. Fischer – J. Schot, 147–166. Island Press: Washington, D.C.

Strauss, Anselm – Corbin, Juliette (1990) *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Sage: Newbury Park, CA.

Strauss, A. – Corbin, J. (1994) Grounded theory methodology: an overview. In: *Handbook of Qualitative Research*, ed. by N.K. Denzin – Y.S. Lincoln, 273–285. Sage: Thousands Oaks, CA.

Szirmai, Viktória (1999) *A környezeti érdek Magyarországon*. Budapest: Pallas Stúdió.

Tsoukas, Haridimos (2000) False dilemmas in organization theory: realism or social constructivism? *Organization*, 7 (3): 531–535.

Tsoukas, Haridimos (1989) The validity of idiographic research explanations. *Academy of Management Review*, 14 (4): 551–561.

Vári, Anna – Caddy, Joanne (eds.) (1999) *Public Participation in Environmental Decisions: Recent Developments in Hungary*. Akadémiai Kiadó: Budapest.

Vergragt, Philip – van Noort, D. (1996) Sustainable technology development: the mobile hydrogen fuel cell. *Business Strategy and the Environment*, 5 (3): 168–177.

Verheul, Hugo – Vergragt, Philip J. (1995) Social experiments in the development of environmental technology: A bottom-up perspective. *Technology Analysis and Strategic Management*, 7 (3): 315–326.

Vickers, Ian – Cordey-Hayes, Martyn (1999) Cleaner production and organizational learning. *Technology Analysis and Strategic Management*, 11 (1): 75–94.

Yin, Robert K. (1994) *Case Study Research: Design and Methods*. 2nd edition. Sage: Thousand Oaks, CA, London, New Delhi.

6. ORGANIZATIONAL ECO-PSYCHOLOGICAL DEFENCES

Tarja Ketola

Abstract

Organisational psychological defences protect the self-esteem and moral integrity of the organisational personality even at the expense of sacrificing the morality of actions. This paper analyses the spectrum of defences used by an oil refinery and its parent company during an oil spill incident. A hypothetical model of defences built on Swajkowski's four responses to accusations of organisational misconduct – refusals, excuses, justifications and concessions – is tested through this case.

On the basis of empirical findings it is obvious that defences delay, impede and interrupt the mitigation and recovery actions of incidents. It is not possible to break the defence behaviour of individuals because it is a built-in psychological mechanism in all humans serving a valuable purpose of dosing the pain of injury. However, it is possible to separate individual and organisational behaviour so that automatic organisational procedures mitigate, recover and, ultimately, prevent incidents. The organisational psychological task of crisis management is to mitigate the organisation's ego defences, recover from its emotional turmoil and prevent further traumas by making its ego stronger and more flexible.

The argument of this paper is that in practice organisational defences act as bumpers against becoming too conscious of the gap between the corporate rhetoric and reality, as subconscious breaks against too fast change demands, and as batteries in their preconscious effort to prepare for the change. Organisational refusals act as bumpers, excuses as breaks and justifications as batteries, while concessions imply that a change towards a more responsible corporation is taking place.

6.1 Introduction

Organisations, like individuals, use psychological defence mechanisms to protect themselves from anxiety caused by internal and external environmental pressures (see e.g. Brown 1997; Brown and Starkey 2000; De Board 1978; Fineman 1996; Hirschhorn and Young 1991; Kets de Vries and Miller 1984; 1991). The self-esteem of organisations is regulated through these ego-de-

fences (Brown 1997). The defences protect the moral integrity of the organisational personality (Feldman 2003) even at the expense of sacrificing the morality of actions. It is more important for organisations to feel that they are moral persons than to face the reality, i.e. the immorality of their actions.

During a crisis, such as an unexpected oil spill, an organisation is pushed to its limits, and often beyond them. An organisation, like an individual, needs to dose the pain it experiences, in order to survive from a blow. Psychological defence mechanisms are essential tools in dosing the pain. For example, denial gives time to comprehend what has happened, intellectualisation makes the incident look logical, projection eases the guilty feelings and rationalisation provides justifications. All these defences soothe the pain until the organisation is mentally ready to sublimate its wrongdoing through compensation. Thus organisations use many different kinds of defence mechanisms to escape responsibility, thrust the incident out of their minds and push off the lurking anxiety.

The most primitive defences include splitting, projection, projective identification and denial. Through splitting organisations often internalise good and externalise evil (Hirschhorn and Young 1991; Morgan 1986). In addition, organisations may project their own shortcomings and failures on others (Brown 1997). If organisations cannot accept some of their negative characteristics, they project them on others and then identify with those others – which is projective identification. One of the most common defences involves denial of facts of reality (Kets de Vries and Miller 1984): organisations can deny that there is a problem or believe that it is not serious.

There are several more advanced defences. Organisations can repress unpleasant events into their unconscious by forgetting, suppressing or distorting information (Brown 1997; Kets de Vries and Miller 1984; Morgan 1986) so effectively that they do not know that they are doing so. Regression means childish behaviour, such as endless disputes with environmental groups or the media. Through idealisation organisations try to forget the evil sides of their leaders or events (Brown and Starkey 2000; Morgan 1986). In reaction formation organisations display the opposite emotion or attitude to the one they actually, but unconsciously, have (Kets de Vries and Miller 1984; Morgan 1986). Hence amiable and co-operative behaviour may conceal latent hostile and competitive urges.

Organisations justify their behaviour through rationalisation to disguise underlying motives and intentions (Brown 1997; Miller 1993; Morgan 1986). Organisations fend off uncomfortable stakeholders by the intellectualisation of their activities, particularly of their technological, chemical, biological and financial issues, in order to make them sound too complicated to understand. If

an organisation is beaten by a competitor or other stakeholder in an issue, it may want to get compensation for the humiliation through retaliation.

In object displacement organisations shift impulses aroused by one person or situation to a safer, weaker target (Morgan 1986). Organisations often try to devalue an event or issue by e.g. publicly underestimating its importance or by staying away from important meetings. Undoing consists of attempts to cancel with rituals a regrettable event. During crises people in organisations often carry on their duties in a ritualistic manner as if nothing had happened. This is an initial reaction to the shock, and it may cause further damage because the situation calls for emergency operations. By introjection organisations internalise positive or negative aspects of their external world in their own psyche (Morgan 1986). The omnipotent fantasies of organisations include claims to omniscience, rightness and uniqueness (Brown 1997; Kets de Vries 2001). When organisations feel threatened, these fantasies defend them against anxiety. Isolation, on the other hand, is an organisation's way of avoiding a problem and the accusers by withdrawing into its shell.

The most advanced defence is *sublimation* in which organisations channel their frustration and anger into socially acceptable forms (Morgan 1986), such as compensation for losses or new goals. Companies must sublimate sooner or later – otherwise they will not survive in their business environment.

6.2 Hypothetical Model of Defences

Swajkowski (1992) has presented, and Bradford and Garrett (1995) have empirically tested, a matrix of four responses to accusations of organisational misconduct: refusals, excuses, justifications and concessions. The different organisational defences can be positioned into this matrix (Ketola 2004) in the way the following figure 1 shows.

According to this hypothetical model organisational refusals include the defences of denial, repression, undoing and omnipotent fantasies. The argument of the model is that with the assistance of these defences organisations refuse to admit both net harm and responsibility. Similarly, organisational excuses consist of the defences of splitting, projection, projective identification, regression, idealisation and isolation, which help an organisation to avoid admitting responsibility. Organisational justifications include the defences of rationalisation, intellectualisation, devaluing, reaction formation, object displacement and compensation. The model maintains that these defences assist an organisation to avoid admitting net harm. Finally, the defences of introjection and sublimation belong to organisational concessions, which help an organisation to admit both net harm and responsibility.

Admits responsibility?	Admits net harm? YES	Admits net harm? NO
YES	Concessions: -introjection -sublimation	Justifications: -rationalisation -intellectualisation -devaluing -reaction formation -object displacement -compensation
NO	Excuses: -splitting -projection -projective identification -regression -idealisation -isolation	Refusals: -denial -repression -undoing -omnipotent fantasies

Figure 1. Hypothetical model of defences: organisational psychological defences within four responses to accusations of organisational misconduct (Ketola 2004: 156).

The explanation power of the above hypothetical model will be tested in this paper. I have added the different defences to the matrix in order to analyse the behaviour of an oil company in crisis.

There was an accidental oil spill at a refinery of a European oil company in December 2001. It started on a Sunday morning at 2.30 am when a night-shift operator thoughtlessly opened a valve he should not have opened. When he realised what he had done, he closed the valve in a state of shock, continued his duties as if nothing had happened and left his shift at 7 am without informing anyone of the incident. The morning shift sensed that something was wrong but would not believe it could have been anything serious. Nevertheless they informed the shift supervisor and started to investigate the matter. Several hours later some leaked oil was discovered within the refinery area. This was dutifully reported to the clean-up team, Operations Manager, Production Manager and General Manager. This minor spill was recovered with ease. No one believed that the spill was of any significance and everyone carried on with their ordinary duties.

Twenty-four hours later, when reports came from external sources that large oil slicks were spotted by the coast of a nearby city and its nature reserve, the truth should have dawned on them – but it did not. The refinery management and workers did not believe it had anything to do with them. They all followed

the operator's initial behaviour pattern, and the situation was allowed to develop into a crisis.

The incident turned out to be very traumatic, particularly for the refinery management and personnel, but also for those at the parent company. They all wanted to talk about it when I went to do 10-year follow-up study interviews of the environmental management development of this oil company in the spring and summer of 2002. In this way the opportunity presented itself for me to conduct a case study on the psychological effects of the oil spill. The empirical information in this paper is based on 14 interviews done at different hierarchical levels of the case oil company (see interview list at the end of the paper) and the newspaper articles written about the incident.

6.3 Starting Point – Splitting

Companies have a twofold task in regard to the environmental shocks and stresses caused by their operations: they must deal with the problem in co-operation with some interest groups and keep all other interested parties informed. They often find the media the most difficult interest group to handle. Companies would like to be in the spotlight when they are improving their environmental behaviour so that they could boost their corporate image through environmental successes. While the media dutifully publish such environmentally benign achievements of companies, they are only too eager to catch the companies in environmentally malignant activities in order to make dramatic news of them. The companies find it unfair that their environmental record is on a regular basis tarnished in public by a single unfortunate incident, either an accident (environmental shock) or an unecological practice (environmental stress).

The case oil company is typical in this respect. On the one hand it is well known of its environmental responsibility, continuous environmental improvement record and openness. On the other hand, every few years the media make headline news of its environmental failure of one kind or another. In these conflict of interest situations both parties see themselves as the warriors of truth and good and the other as the evil villain. This reflects one of many common psychological defence mechanisms (see Freud 1966) the purpose of which for individuals is to protect their ego or self-esteem and for organisations is to maintain their collective ego or self-esteem (Brown and Starkey 2000) at times they feel vulnerable, inadequate, inferior or guilty (Hirschhorn and Young 1991).

The ego defence in question is *splitting*: the image of both oneself and the other is split into two, good and evil; the good is internalised and the evil externalised, i.e. projected on the other (Hirschhorn and Young 1991; Morgan

1986). This was the starting point of the oil spill incident that took place in the case oil company's refinery at the end of year 2001. The further psychological defence mechanisms the oil company and its refinery resorted to because of media pressure are described and analysed below.

It must be noted that, unlike another refinery owned by the same company, the case refinery has for decades had exceptionally good relations to local political decision-makers, the media and local people. It had never had any problems with them in environmental affairs. The refinery is a major employer of local people, a major taxpayer in the area and it has minimised its environmental disturbance to the neighbours by following the principle of "not to be seen, heard or smelled". Hence it has little practice in dealing with the twofold task of dealing co-operatively with the environmental incident and satisfying the information needs of the public through the media at the same time. The refinery was caught unawares and unprepared. That is why its reactions are interesting: they show what primitive responses lie directly under the surface of every organisation and person.

6.4 Phases in Defence Behaviour

A large oil slick was spotted in the sea approaching the coasts of a large city and its nature reserve a couple of kilometres outside the oil refinery in December 2001. The origin of the oil could have been a passing ship, some source in the harbour area or the oil refinery. The Communications Manager of the refinery hastened to inform the media that the oil was not originated from the refinery – although there had simultaneously been a minor oil spill from their own over-flown waste oil tank, which had been restricted to the refinery area.

It was unthinkable that any large amount of oil could have leaked into the sea from this refinery. The refinery had built a modern wastewater treatment plant already in 1975 to prevent such incidents and to minimise consented emissions. It had changed this partially closed system into a fully closed system in 2000. The refinery had also had an ISO 14001 -based environmental management system and an ISO 9000 -based quality system with external audits in place since 1998 and it had conducted regular internal audits since early 1990s. Therefore *repression* was firm – and not only by the refinery. The country's largest newspaper wrote later in its leading article: "the guilty party turned out to be the one who was suspected from the beginning but could not be believed to be possible… …once again an accident happened that had been prevented by all possible measures".

The police began to investigate the incident and said that the refinery could not be ruled out. The refinery's General Manager reacted by absolute *denial*

and *intellectualisation*. At a press conference he brought evidence that in his opinion proved the refinery innocent of the oil slick. The refinery's own laboratory had taken samples of both the large oil spill in the sea and the minor oil spill in the refinery area as well as of the waste oil in the tank that had overflown. Their analyses showed that the type of oil was different in the two spill cases and the oil from the large spill did not match the oil in their tank; therefore the oil slick could not be originated from the refinery. It would be best for the corporate image to be found innocent, but if this verdict could not be achieved, it was very important for the refinery not to be found guilty. If the culprit was not found, the oil protection fund would pay for the recovering costs and the damage caused by the oil slick.

During the press conference the Production Manager of the refinery explained what had happened during the minor oil spill in the soil in the refinery area, what recovering measures had been taken and how with changed practices similar incidents would be prevented from happening again. In ordinary circumstances such a detailed account would not be given to the media, only a brief press release about a small spill that was under control. By explaining the minor spill the people in the refinery prepared to *reason* the major spill that they could not yet admit. By telling about their recovery and mitigation measures related to the minor spill they took their first steps of *sublimating* their guilty feelings of wrong-doing by correcting the mistakes and doing right.

There is a line responsibility in environmental issues in the oil company in question. This means that each operating unit is responsible for its own operations, emissions and incidents, deals with them in co-operation with the authorities and other stakeholders and communicates about its activities with the media and other interest groups. The headquarters of the oil company did not interfere with this incident either. The Refinery General Manager was in charge. He delegated the recovery, mitigation and communication tasks to his subordinates. The line management from the General Manager down to the Production Manager, the Operations Manager, supervisors and operators must have been busy trying to deal with both the technical and human side of the incident – and trying to comprehend how the unthinkable could possible have happened. In such circumstances it is easier to be among expert staff, where there are no line responsibilities and nobody can blame you for the incident. Another large oil slick was then found floating near the refinery. The Environmental Co-ordinator was the first person in the refinery who could afford to admit in public the possibility that the large oil slicks might have been originated from the refinery although they had not found any leak that would correspond to them. Since he belonged to the expert staff he would not be responsi-

ble for the spills but he could internalise through *introjection* the suppressed guilty feelings experienced by the line management.

The line management could not admit this possibility. They resorted to *undoing* and *devaluation.* The estimated amount of waste oil leaked from the refinery ranged from 3 to 630 cubic meters depending who in the refinery was talking, the General Manager giving the lowest and the Environmental Co-ordinator the highest estimations. No exact amount was ever given, and the annual report of the oil company devalued it into 300 cubic meters. In the middle of the incident the Communications Manager left for a holiday and the General Manager went to visit the headquarters for two days. What he did at the headquarters was not told at the time but his superior, the Director of Oil Refining, told me later that the Refinery General Managers pay him a visit routinely every week. However, the symbolic message given to the interest groups was that there were no problems that would require the top manager and his right hand to be present. They may have unconsciously thought that the problem would disappear if they disappear. When the General Manager returned to the refinery he told the media that he had been away and had no knowledge of further oil spills or oil barriers put around the refinery by the police.

The General Manager of the refinery was then confronted with police information that ships had been ruled out and that air surveillance had observed continuous oil slicks coming from the refinery's direction. Suspicions were focusing on the refinery. The General Manager responded with *omnipotence*: in his opinion it was unlikely that the oil slicks were theirs as it would be odd if an oil company could not analyse oil samples.

The police claimed that it was possible to prove that the source of all these oil spills was the refinery. The General Manager *regressed* into childish *denial*: the refinery was not responsible! – just like a small child with his mouth covered with chocolate would claim: I have not eaten chocolate!

When the police published their analyses of the oil samples from the spills and the refinery's waste-oil tank, and proved that they were of the same type, the General Manager informed the public that he was surprised that the crime laboratory's results confronted with the refinery laboratory's results. He demanded a chance to compare the analyses. After comparison, he *rationalised* that the crime laboratory had evaporated the samples like they would evaporate in the sea, but the refinery laboratory had not done it, and that had led to different results.

Now the General Manager announced that the refinery had been pointed out as the guilty party and that they would humbly receive the information. He still refused to admit responsibility. The emotions – surprise and humility – reflect in this case the defence mechanism of *reaction formation* in which a

person expresses emotions that are opposite to those that he really feels in order to hide his real emotions. It is possible that the whole repertoire of defence mechanisms used to combat this spill incident is an indicator of reaction formation: the refinery management's painful uncertainty may be hidden behind his stubborn refusal through a variety of defences to accept the reality.

By demanding a chance to compare the analyses, the General Manager attempted to question the crime lab's results. He also criticised the length of time it had taken the police to publish the results of their analyses and emphasised that the refinery had published their results immediately. By blaming the police and its crime lab he turned his anger from the media towards the authorities. This *object displacement* usually works as an efficient tension relief mechanism: if you do not dare to attack the one that hurts you because he is too powerful and may crush you, you attack someone who is weaker than you and take revenge on him. In this case it would have been unwise to attack the media because they could easily hurt the refinery more.

In other words the General Manager tried to *project* on the police the blame of the long distress he had suffered because of the unsolved incident. But in the long run it would be dangerous to attack the authorities, too, because they could make the refinery pay huge fines, costs and compensations and make more stringent demands on the refinery's environmental protection measures.

Faced with the verified results of the crime lab that proved the refinery responsible for the spill, the General Manager needed to mitigate his own guilty feeling by pointing out the real culprit, the operator whose mistake had caused the incident. Piously the General Manager pleaded the media to have mercy for this poor operator who was a long-term employee. In this way the Manager tried regain his internal balance through *projective identification*. He could not admit his guilt but projected it on the operator and then identified with this operator in his own need to be forgiven.

By this time the Vice-President of Communications of the parent company interfered by giving advice to the General Manager and appearing on the television in order to reassure the public that the oil company would bear its responsibility for the incident.

However a few weeks later the General Manager was back in the fight and informed the media that the oil company would pay for the recovery and damages only if it was proven guilty. This bold *undoing* caused concern among the public and the landowners who believed that the case had already been closed. Now, for the very first time, the General Manager's own supervisor interfered: the Director of Oil Refining from the headquarters told the media that the oil company was waiting for the police investigations to be completed. The General Manager explained to me that the insurance company had demanded firm proof of the refinery's guilt but had then been persuaded to pay compensation

even before the case would go to court. Hence two months later the Communications Manager of the refinery informed the media that the company would pay the recovering costs and damages irrespective of whether the case goes to court or not. It took altogether three months for the refinery to *accept* its liability and *sublimate* its guilty feeling into a commitment to compensations.

6.5 The Balloon Effect of Defences

This oil spill case grew into huge proportions because of the attempts by the refinery management to fend off the unthinkable but real incident with the assistance of a series of defence mechanisms. The number of real victims and those who felt offended grew by every defence. *Repression* of the thought that the refinery could be responsible for the oil spill enabled the leak spot to remain undiscovered and increased the amount of oil spilled into the soil and sea from which it spread to the shores of the city, nature reserve and private land.

Denial through the *intellectualisation* of the incident turned against the refinery as the analyses of the refinery lab turned out to be flawed. In addition to the oil company's tarnished image as an expert in oil analyses this may have long-term impacts on the refinery as its own lab takes all the legally required samples, analyses them and gives only the final results to the authorities. Will the authorities trust these analyses any more as a basis of their legal obligation to control the emissions of the refinery and the compliance with their consents?

The *omnipotence* of the oil company as the best expert expressed by the refinery General Manager may provoke the authorities to adopt a painstakingly thorough approach towards the refinery's environmental affairs.

Reasoning placed the responsibility of the incident on one single operator although the refinery should have had such precautionary measures in place that a human error causing this much damage could not have been possible. *Introjection* by an environmental Co-ordinator shifted the responsibility from line management and displaced it on expert staff.

Undoing had taken place from the very beginning: the relevant authority's report later discovered that the incident had not been immediately reported up the line within the refinery and the refinery had not immediately reported it to the authorities. The delay in reporting delayed the recovering, mitigating and preventive measures, increased the damage and led to further undoing attempts by the line management as well as to other defences.

By *devaluing* the incident the refinery management devalued the media. In fact the media felt misled and deceived by the refinery and attacked it in the

leading articles of the main newspapers accusing it of bold negligence, shadiness, secrecy and cover-up. The directors of the oil company claimed that they had had no wish to mislead the media, the public or other interest groups, and maintained that it had been a communications failure: the analyses and conclusions of the incident expressed by the oil company had been too strong and premature.

Regression and childish *denial* when facing the facts proved the public that an oil company despite all its rhetoric does not take responsibility for its actions. The false surprise and humility of *reaction formation* made the refinery General Manager sound like a hypocrite.

Object displacement, i.e., turning the blame outside to the police crime lab and inside to one single employee, certainly did not endear him to the authorities or the employees. Asking for mercy through *projective identification* sounded odd at the time when firm responsible leadership was expected. Firmness in leadership appeared in wrong issues: a couple of weeks later the General Manager was again firmly *denying* any liability for the damages of the oil spill. This upset particularly the summer cottage owners and nature conservation groups who were concerned about the watersides and shores contaminated by oil.

Only by *accepting* liability for the recovery and damages the refinery managed to calm down the interest groups who were more than willing to co-operate. During the incident some refinery people had already worked with the fire services in oil recovery but the management declined any help-offers from environmental groups. Instead the refinery sent contractors to clean up the shores. To show some co-operative spirit the refinery organised a voluntary rubbish-clearing day in the nature reserve with local nature conservation groups and environmental groups. This was a clever move. The interest groups most seriously concerned about the state of the nature reserve could walk along its shores with the refinery management and employees and find that no oil was to be seen any more. The media reported this good news and began to write about the refinery more positively emphasising its efforts and co-operative spirit.

It was easy for me to observe other people's behaviour and analyse it critically, but I would not have wanted to be among the refinery line management when the oil spill happened. Every person caught unawares in an unfamiliar crisis acts in strange ways that well out from our unconscious. Rationality walks out of the door and irrationality rushes in. We wish to protect our own personal ego and the public image of our organisation by fair means or foul. If we have no previous experience of the ordeal we are going through we make mistakes, which pile up and push us deeper into our foxhole.

The refinery management followed – with some delay – the procedures set for reporting, mitigating and recovering environmental incidents and co-operated with the authorities and other interest groups to the best of their abilities. Their only real fault was that they kept on trying to deny their increasingly probable liability for the incident in almost every possible way. Their behaviour is understandable: nobody wants to stand before the court accused of gross environmental damage and face a fine or even imprisonment. If this case goes to court, the General Manager of the refinery may be personally responsible for the incident. Since the oil company finally accepted liability for the damages, the case may not go to court.

The only common defence mechanism the refinery management did not use during the incident was *isolation* in which a person remembers the facts of the incident but cannot recall his feelings related to this incident and relate to them. The oil spill swung the emotions of the General Manager from one extreme to another and back at the time; therefore it may well be possible that he needs to isolate his over-flown emotions from the incident in order to cope with it. Psychologically it would be better to accept the dent in the ego and learn from the bitter experience for the next ordeal. I interviewed him on 17 June 2002 and at that time he said that they at the refinery had really "blown it" and they had "made fools of themselves" – so at least a collective dent in the ego was accepted.

The ego defences protect the self of an individual and an organisation so powerfully that they have a dysfunctional influence on them at times when change of thought and/or action is required (Brown and Starkey 2000). The defences try to shield us from anxiety that lurks in our subconscious. They are an attempted means of coping with an otherwise consciously intolerable situation (Brown and Starkey 2000, Freud 1966). If the external event threatens our core identity, the combat between anxiety and defences intensifies. If the defences win, the trauma remains unprocessed in our subconscious and interferes with our future behaviour in unexpected ways. If anxiety wins, we are forced to deal with the trauma. Organisations are made of individuals and therefore behave in similar ways, often reinforcing individual defences and exacerbating the problem.

6.6 Testing the Hypothetical Model of Defences

In figure 1 at the beginning of this paper the different psychological defences were added to Swajkowski's (1992) matrix of four responses to accusations of organisational misconduct: refusals, excuses, justifications and concessions.

This hypothetical model of defences is here tested with the evidence from the above oil spill case.

According to Swajkowski (1992), when an organisation admits neither net harm nor responsibility for misconduct, it resorts to refusals. According to our model, these refusals can take different forms: an organisation may be in denial, it may repress misconduct into its unconscious, it may try to undo misconduct with tricks, or it may have omnipotent fantasies about its own greatness in order to forget its misconduct. The case oil company started with these refusals and returned to them every time the reality was too much to bear.

Swajkowski (1992) says that, if an organisation admits net harm but not responsibility for misconduct, it uses excuses. According to our model splitting, projection, projective identification and regression are common excuses, with which an organisation can claim that someone else is responsible for the occurrence. Idealisation also wipes an organisation clean of any misconduct. Isolation helps an organisation to distance itself from both the incident and the accusers. The case oil company used all these excuses in turn when the harm caused by the oil slick became apparent.

In Swajkowski's (1992) opinion, organisations, which admit responsibility for misconduct but do not admit that their misconduct has caused net harm, utilise justifications. Our model states that common justifications include rationalisation, intellectualisation and devaluing. In addition, through reaction formation an organisation tries to hide its anger for having been caught. Through object displacement it can direct this anger to a third party – if it does not dare to use compensation to retaliate on the informer. When the case oil company had to quietly admit to itself that the probability of its responsibility for the incident was high, it resorted to justifications. At first rationalisation and intellectualisation kept the company's managers emotions at check, but when evidence of its guilt was piling up, anger was turned into its opposite, directed to third parties and let loose through internal retaliation.

Swajkowski (1992) maintains that an organisation uses concessions when it admits both net harm and responsibility for misconduct. Our model identifies two concession defences: introjection and sublimation. Introjection is a helpless way of pleading guilty, but sublimation is a constructive form of concession. During the oil spill an expert who had no power to change the case oil company's behaviour introjected the incident. Only after several weeks the company could humble itself to sublimate by admitting liability and promising to pay compensation.

Bradford and Garrett (1995) conducted an empirical study on the impact of the four corporate responses on corporate image. In their research setting companies responded to accusations on unethical behaviour in four different situations:

In a commission situation (i.e. company can provide evidence that it did not commit the alleged action), all four responses improved corporate image: refusals the least, excuses and justifications moderately and concessions the most.

In a control situation (i.e. company can provide evidence that it did not have control over the occurrence), refusals deteriorated corporate image significantly, justifications improved it moderately and excuses and concessions improved it significantly.

In a standards situation (i.e. company can provide evidence that inappropriate standards are used to evaluate the action) excuses and refusals deteriorated corporate image significantly, justifications improved it slightly and concessions improved it significantly.

In an agreement situation (i.e. company concludes that the allegations are valid) refusals and excuses deteriorated corporate image significantly, justifications improved it slightly and concessions improved it moderately. In all situations concessions had the best impact on corporate image.

Bradford and Garrett's setting can be applied to the case oil company's responses during the oil spill incident. The case oil company tried, but could not, provide conclusive evidence that it had not spilled the oil. Nor could it maintain that it had no control over the incident. And it could not claim that inappropriate standards were used to evaluate its action. And yet the case oil company resorted to the four refusal and six excuse types of defences, all of which deteriorated its corporate image significantly. The six justification types of defences, which might have improved the image only slightly, anyway, could not neutralise the deterioration effect. The two concession types of defences were used so little and so late that they became powerless. After a fortnight the oil company's image had plunged into record depths. Only once the company admitted the validity of the allegations, its corporate image started a slow recovery. It took months for the image to rise back to its normal level.

The main learning from the testing of the hypothetical model of defences in an oil spill case is that organisational psychological defence mechanisms have an important role in the slow and often painful adjustment process of accepting liability and becoming a more responsible corporation. In the case organisation the defences had a role of (1) bumpers against becoming too conscious of the gap between the corporate rhetoric and reality, of (2) subconscious breaks against too fast change demands, and of (3) batteries in their preconscious effort to prepare for the change.

Hence the defences both discouraged and encouraged change of attitude and behaviour at the same time. These conflicting roles had their purpose but also allowed the situation become worse before getting better. This coincides

with Hirschhorn and Young's (1991) finding that social defences help people working in dangerous settings contain their anxiety and feel safe while at the same time the same defences reduce people's ability to work safely, creating new dangers.

6.7 Conclusions: Breaking the Defence Behaviour Pattern?

I do not think that is possible to break the defence behaviour of individuals because it is a built-in psychological mechanism in all humans serving a valuable purpose of dosing the pain of injury. However, I do believe that it is possible to prevent the individual defences from delaying, impeding or interrupting the mitigation and recovery actions of incidents. Individual and organisational responses should be kept separate from each other. There should be room for individual feelings of disbelief, anxiety, anger and guilt during an upsetting incident. The experiences of the stages of shock, reaction, working through and re-orientation (Cullberg 1992, Saari 2000) are essential for individuals to regain their mental balance after a traumatic event.

Therefore, repression, regression, denial, projection, rationalisation, intellectualisation and other defence mechanisms are necessary in the gradual process of adjusting to the crisis – but only at the individual, not at the organisational, level. An organisation must create, put in place and practice *procedures that automatically go off* and *cause an inevitable chain reaction of mitigating and recovering actions* when anything unusual takes place. These procedures must not be dependent on individuals. The individual responses in a crisis cannot be trusted to be rational, as we have noticed.

In practice simple technical devices alone could have prevented the oil spill from happening at the case refinery. Despite technical audits and earlier near-miss situations nobody had bothered to equip the valves with safety locks or the waste-oil tanks with exact measuring systems. These human failures led to a human error and humans at every organisational level tried to conceal what had happened. Covering up took most of their attention at the time when the numbness of the shock stage could have been directed to reporting the incident in order to restrict the damage to the minimum. The tunnel vision caused by the shock stage could have been directed to concentrating on the mitigating and recovering operations.

Now the case refinery has the technical systems and new organisational procedures in place. Hirschhorn and Young (1991) note that incidents highlight the systemic nature of production systems: everyone and no one is to blame. They maintain that procedures play a critical role in helping people strike the balance between work and worry – they need to follow procedures

but do so with intelligence. Hirschhorn and Young put is simply: you prevent incidents by imagining that you have already had them. Organisational defences begin to fall down when people stop acting and start thinking.

At the moment the challenge lies in motivating the staff to report anything out of the ordinary. The payment system of the whole personnel could be changed to motivate reporting: near-miss reporting should be rewarded. In the present payment system an incident often reduces the productivity bonus because it may halt or slow down production and/or cause environmental damage. This is an incentive to operate carefully and cautiously but a disincentive to report a spill or other incident that the operators, supervisors or management think might go unnoticed. Therefore, prompt reporting should be rewarded so generously that it would reduce the loss of productivity bonus caused by a restricted incident enough to make reporting worth while.

The personnel look up to the management for leadership and example. A defence mechanism called *symbolisation* (Morgan 1986) could be useful in preventing crises. The symbolic behaviour of the management goes down the line. The behaviour of every manager and supervisor counts. The unpleasant feelings of the reaction stage of a crisis could be utilised to encourage responsible behaviour at every level of organisation. Nobody wants to feel shame, anxiety, despair, guilt or sorrow. Every operator, supervisor and manager should be made to feel pride for his area of responsibility and shame for neglecting it.

Organisational hierarchy reflects symbolisation: hierarchy reduces uncertainty about responsibilities, reporting relationships and decision-making powers (Brown and Starkey 2000). A supervisor is responsible for a number of operators, a manager for the whole staff of his department and the General Manager for the whole refinery personnel. Hence pride and shame spread along the line. One operator neglecting his duties would not act irresponsibly on his own but would make his supervisor, the department's manager and the General Manager ashamed of neglecting their supervisory and leadership duties.

Accusing subordinates or finding a single culprit for an incident should not be allowed. This was emphasised by the President of Oil Sector who said that his approach was non-punishing: the superiors and subordinates together ponder how to prevent the incident from happening again. Instead, the knowledge of potential collective disgrace should make every person to do his best to avoid negligence. This requires team spirit, strong leadership, openness and integrity. The anxiety for the thought of pulling all the others down with his own irresponsible behaviour is a great motivator. Mental imaging might help people to realise what it feels like to let others down. In fact mental imaging could be used to create or recreate in every person the shame, anxiety, despair,

guilt and sorrow that those who had experienced the traumatic oil spill had felt. This would create empathy between different individuals and increase the sense of collective responsibility.

In summary, the psychological handling of crises resembles its factual handling: mitigating, recovery and future prevention measures are essential in both. Factually, a crisis such as an oil spill needs mitigation of damage, recovering of oil and preventing the incident from happening again. Psychologically, for both individuals and organisation, the task is to *mitigate the ego defences, recover from the emotional turmoil* and *prevent further traumas by making the ego stronger and more flexible*.

This paper has presented a new way of looking at the environmental management of corporations. I call it an *upside-down inside-out approach*. It resembles the way in which we wash the jeans of our little rascals: first turn the jeans upside-down, and all the little treasures and secrets fall out of the pockets; then turn the jeans inside-out, and see how the little wounds of adventures have marked the cloth; and finally wash the jeans and tumble-dry them, so that they will become as clean and fresh as a new pair of jeans. This kind of upside-down inside-out approach to environmental management is a tough but refreshing way of reshaping organisational behaviour.

6.8 Further Research Potential

There are many ways this study could be developed further. First of all it is possible to look at the whole oil spill event process from the crisis management point of view, by thoroughly analysing the different stages of the incident: shock stage, reaction stage, working-through stage and re-orientation stage (Cullberg 1992, Saari 2000).

Secondly, an argument by Simola (2003) that both an ethic of justice and an ethic of care could be appropriate approaches in corporate crisis management, could be examined in this oil spill case. This perspective would be complementary to my psychological approach, as it would allow the company to build and commit itself to an internal ethical system that would probably lower its defences.

Thirdly, Mellema's (2003) concept of moral taint could possibly explain the different reactions to the spill at the parent company compared to the refinery. Mellema maintains that when distance between a person and a state of affairs grows sufficiently large, moral taint can describe his moral status in the situation. This argument would require further investigation, which could be combined to Simola's argument in order to modify the experienced taint both at close and at long distance from the incident.

Finally, the argument of this very paper is that organisational psychological defences have an important role in the slow and often painful but continuous change process towards a more responsible corporation. For the organisations and their members the defences act as bumpers against becoming too conscious of the gap between the corporate reality and its rhetoric, as subconscious breaks against too fast change demands, and as batteries in their preconscious effort to prepare for the change. However, in crises organisations often behave in extreme ways, which may not resemble their every-day behaviour. To make a stronger point of the roles of defences in organisation behaviour, it is necessary to look into the normal behaviour of organisations. The hypothesis I shall further test under ordinary (non-crisis) circumstances is that *refusals act as bumpers, excuses as breaks and justifications as batteries*, *while concessions imply that a change towards a more responsible corporation is taking place*.

Interviews at the Case Oil Company

-President, Oil Sector, 7 May 2002

-Vice-President, Communications, 23 August 2002

-Director of Environment, Health and Safety, 7 May 2002

-Director of Oil Refining, 7 May 2002

-Communications Manager of Oil Refining, 7 May 2002

-General Manager of the Refinery, 17 June 2002

-Communications Manager of the Refinery, 17 June 2002

-Production Manager of the Refinery, 23 July 2002

-Environment, Health and Safety Co-ordinator of the Refinery, 17 June 2002

-Operations Manager of the Refinery, 25 June 2002

-Two Operations Masters of the Refinery, 25 June 2002

-A Supervisor of the Refinery, 23 July 2002

-An Operator of the Refinery, 23 July 2002

References

Bradford, J.L. – Garrett, D.E. (1995) The Effectiveness of Corporate Communicative Responses to Accusations of Unethical Behavior. *Journal of Business Ethics,* 14 (11): 875–892.

Brown, A.D. (1997) Narcissism, Identity and Legitimacy. *Academy of Management Review,* 22 (3): 643–686.

Brown, AD. – Starkey, K. (2000) Organisational Identity and Learning: A Psychodynamic Perspective. *Academy of Management Review,* 25 (1): 102–120.

Cullberg, J. (1992) *Kris och utveckling – en psykodynamisk och socialpsykiatrisk studie*. Tredje, något reviderade upplagan. Natur och Kultur: Stockholm.

De Board, R. (1978) *The Psychodynamics of Organizations.* Tavistock: London.

Feldman, S.P. (2003) Weak Spots in Business Ethics: A Psycho-Analytic Study of Competition and Memory in "Death of a Salesman", *Journal of Business Ethics,* 44 (4): 391–404.

Fineman, S. (1996) Emotional Subtexts in Corporate Greening. *Organization Studies,* 17 (3): 479–500.

Freud, A. (1966) *The Writings of Anna Freud, Volume II: The Ego and the Mechanisms of Defence*. Revised edition. International Universities Press: Madison CT.

Hirschhorn, L. –Young, D.R. (1991) Dealing with the Anxiety of Working: Social Defenses as Coping Strategy. In: *Organizations on the Couch: Clinical Perspectives on Organisational Behaviour and Change,* ed. by M.F.R. Kets de Vries, 215-240. Jossey-Bass: San Francisco.

Ketola, T. (2004) Eco-psychological Profiling Model: An Oil Company Example. *Corporate Social Responsibility and Environmental Management* 11 (3): 150–166.

Kets de Vries, M.F.R. (2001) *Struggling with the Demon: Perspectives on Individual and Organizational Irrationality*. Psychosocial Press: Madison, Connecticut.

Kets de Vries, M.F.R. – Miller, D. (1984) *The Neurotic Organization*. Jossey-Bass: San Francisco and London.

Kets de Vries, M.F.R. – Miller, D. (1991) Leadership Styles and Organizational Cultures: The Shaping of Neurotic Organizations. In: *Organizations on the Couch: Clinical Perspectives on Organisational Behaviour and Change*, ed. by M.F.R. Kets de Vries, 243–263. Jossey-Bass: San Francisco.

Mellema, G. (2003) Responsibility, Taint, and Ethical Distance in Business Ethics. *Journal of Business Ethics,* 47 (12): 125–132.

Miller, D. (1993) The Architecture of Simplicity. *Academy of Management Review,* 18 (1): 116–138.

Morgan, G. (1986) *Images of Organization*. Sage: Newbury Park, London and New Delhi.

Saari, S. (2000) *Kuin salama kirkkaalta taivaalta – kriisit ja niistä selviytyminen.* Otava: Helsinki.

Simola, S. (2003) Ethics of Justice and Care in Corporate Crisis Management. *Journal of Business Ethics,* 46 (4): 351–361.

Swajkowski, E. (1992) Accounting for Organizational Misconduct. *Journal of Business Ethics*, 11 (5/6): 401–411.

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