Diffusion and Regulatory Cooperation between the EU and South Korea: The Case of Chemicals

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1 Introduction

This paper investigates chemicals regulation in the European Union (EU) and South Korea. Both jurisdictions have shown a increased level of regulatory activity in recent years with the EU developments preceding the South Korean by only a few years. While the EU engaged in a major overhaul of its regulation, which was adopted in late 2006, South Korea has amended its chemicals law five times between 2004 and 2008 and issued a draft proposal for a major reform in 2011. Both regulatory developments have communalities but also differences. This paper argues that EU chemicals regulation had effects on policy developments in South Korea and it explores opportunities for enhanced, mutually beneficial EU-South Korean cooperation.

Chemicals are an important part of everyday life. Most consumer products from toothpaste to electronics rely on the use of chemicals in their production process or contain chemicals. Given chemicals' near ubiquity, ensuring their safe use and minimising the potential risk that they can pose to humans and the environment is important. Guaranteeing the exploitation of chemicals' benefits while minimising their potential risks has been part of the environmental and industrial policy in most industrialised countries since the 1960s. The EU and South Korean reforms aim at improving previous efforts and bringing chemicals regulation up to the challenges of technological progress and economic developments.

The EU has regulated chemical risks since 1967 when it introduced labelling and classification rules. In 2007, an ambitious and comprehensive reform of European chemicals regulation entered into force – the Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH).[1] It goes beyond previous EU and international chemicals policy in its ambition and scope. South Korea has regulated

[1] Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.

chemicals since 1991, when it introduced the Toxic Chemicals Control Act (TCCA). In 2011, the South Korean Ministry of Environment (MoE) issued a draft proposal for a major revision of its chemicals regulation, entitled Act on the Registration and Evaluation of Chemicals. This legislative proposal would signify a deep reform of South Korean chemicals regulation.

Both the EU REACH Regulation and the South Korean draft legislative proposal have many similarities. When zooming into the details, however, also differences can be detected, too. Nevertheless, the similarities between EU and South Korean chemicals regulation suggest that these are not entirely disconnected processes but rather that there are links, for example, in the form of learning processes and market interdependencies. Section two of this paper compares EU chemicals regulation and the South Korean draft proposal, showing that there are a number of similarities but also some differences. The ensuing section presents the analytical framework for the empirical investigation of the EU's effects South Korean chemicals regulation, which is subject to section four. Section five explores possibilities for enhancing cooperation between the EU and South Korea in the area of chemicals regulation. Especially since South Korea is currently in the process of revising its chemicals regulation, cooperation at this early stage of the regulatory lifecycle promises great potential for effective cooperation and synergies that could minimise regulatory divergences and inefficiencies.

2 EU and South Korean Chemicals Regulation

In 2006, the EU adopted the REACH Regulation, which introduces a number of elements that did not exist in previous EU or any other global chemicals regulatory framework. Given these novel elements, the EU REACH Regulation can be considered a pioneering effort. Pioneering is understood as entering unchartered waters by adopting a new approach or new requirements that had not been applied in that way or to that policy area before. This includes the setting of highly ambitious and stringent requirements as well as deregulation and the lowering of standards. The decisive characteristic of pioneering regulation is its novelty in the sense that no other jurisdiction has adopted it before.

In February 2011, the South Korean MoE published a draft proposal for a far-reaching chemicals policy reform and made it subject to public consultation. The

proposal is entitled: Act on the Registration and Evaluation of Chemicals,[2] which suggests some similarities with the REACH Regulation. In 2012, MoE issued a revised draft. This law would significantly change current South Korean chemicals regulation. Its scope and requirements are however less ambitious than REACH. The legislative proposal is expected to be submitted to the South Korean National Assembly in late 2012 or early 2013 with anticipated adoption in mid-2013. The Act would enter into force in 2015 (Fallström Mujkic 2012: 12).[3] While the National Assembly could alter the proposal, observers do not expect fundamental changes. Since the likelihood of adoption is very high, this paper focuses on the legislative draft because for an exploration of possibilities for the enhancement of EU-South Korea cooperation on chemical regulation it seems more relevant to focus on the developments expected for the near future rather than on the past. The subsections below compare the EU REACH Regulation and the South Korean draft proposal for an Act on the Registration and Evaluation of Chemicals. They highlight the (draft) regulations' main novel elements.

2.1 Shortcomings of Prior Chemicals Regulatory Regimes

EU pre-REACH and current South Korean chemicals policy encountered some shortcomings, which are mainly a lack of data on the hazards and the uses of chemicals, a slow progress of assessing chemicals and regulating risks, and a low degree of innovation activities for safer alternatives to hazardous chemicals. Schwarzman and Wilson (2009: 306) labelled these three shortcomings – that are common not only to pre-REACH and South Korean chemicals laws but can also be observed in other countries such as the United States (US) – the data gap, the safety gap and the technology gap.

One of the reasons for reforming EU chemicals regulation was the lack of hazard and risk data for many chemicals although a number of them had been in commercial use for decades. This shortcoming was the result of a distinction between existing and new chemicals. Substances newly placed on the EU market after 1981 had to undergo stringent testing requirements. Substances that were already in commercial

[2] The information related to the Act on the Registration and Evaluation of Chemicals presented in this paper is based on an unofficial English translation kindly provided to the author by an industry source and on a personal conversation with an expert involved in the South Korean process.

[3] Author's personal communication with a MoE member of staff, 29 May 2012; with experts involved in the South Korean process, 19 June 2012; presentation by South Korean chemicals regulation expert, 26 June 2012.

use in the EU prior to 1981 were considered existing chemicals and could be used without additional testing or registration requirements. Existing chemicals represented about 99% of the volume of all chemicals on the EU market. Only very few of high production volume chemicals had full data sets and for a significant number no data was available. Moreover, the way in which chemicals are used in production processes and products was not known. This made it difficult to assess the actual risk that a chemical can pose. The lack of data has as a result that the environmental and human health implications of a number of chemicals could not or only with difficulties be assessed. Assessing the risks of chemicals that were already in commercial use and regulatory responses addressing potential risks progressed slowly. The degree of innovation activities for safer alternatives to hazardous substances was low because using existing chemicals was less costly and time-consuming (Allanou et al. 2003a, 2003b; Biedenkopf and Park 2012: 783-84; Hansen and Blainey 2006: 270-71; Williams et al. 2009: 554-55).

South Korean chemicals regulation dates back to 1991, when the Toxic Chemicals Control Act (TCCA) was adopted. Like pre-REACH EU regulation, TCCA makes a distinction between existing (in domestic commerce before 1991) and new chemicals (brought into domestic commerce after 1991). Prior to placing new chemicals on the South Korean market, producers must provide the MoE with data on the respective chemical's physical and chemical properties, its toxicity to human health and the environment, its degradability etc. On the basis of this data, the authorities determine whether more data should be generated and whether measures to protect the environment and human health should be introduced. Similar to the pre-REACH regulatory framework, TCCA does not impose the same data requirements on existing chemicals. The authorities have the right to regulate substances that are already in South Korean commerce but as previously in the EU this process is slow. Only 15% of existing chemicals have been evaluated under the TCCA framework.[4] The shortcomings that South Korea faces are thus almost the same as the EU did prior to REACH, namely a lack of hazard and use data for existing chemicals, slow progress in assessing the risks of chemicals and a low degree of innovation for safer alternatives because the use of

[4] Author's personal communication with experts on South Korean chemical regulation, 19 June 2012; presentation by South Korean chemicals regulation expert, 26 June 2012.

existing chemicals is less costly and time-consuming than the placing on the market of new chemicals.[5]

2.2 Systematic and Comprehensive Approach

Both REACH and the draft South Korean proposal are based on a systematic approach, composed of three main consecutive steps, that begins with the gathering of data. Both laws include as a second step the evaluation of prioritised chemicals, which can lead to the third step, the imposition of conditions for the continued use of chemicals that were found to pose a certain risk. REACH and the South Korean draft provide for a procedure in which producers[6] must request prior authorisation before using a chemical. As alternative regulatory restriction measures can be adopted.

The REACH Regulation established the Helsinki-based European Chemicals Agency (ECHA) that coordinates and centralises the main parts of the implementation of the Regulation. REACH is composed of three main stages: registration, evaluation, and authorisation/restriction. By the end of May 2018, all chemicals put on the EU market in quantities over 1 tonne per year per producer must be registered in a central database by submitting defined sets of data to ECHA. Only registered chemicals are permitted on the EU market. In the evaluation stage, EU Member States analyse the data that producers submitted and assess the chemicals' potential risks. As an evaluation result, the use of substances that were found to be of very high concern can be made subjected to authorisation requirements. In this case, producers may only put the respective substance on the EU market if they have received prior authorisation by the authorities to do so. As an alternative to mandated authorisation, EU-wide restrictions of substances can be imposed.

The South Korean draft proposal would require all producers to submit every other year information about the volumes and types of the chemicals that they placed on the South Korean market in quantities above one tonne. Based on the submitted and on other available data, the MoE would select and designate substances as subject to evaluation. Producers of these chemicals would be required to submit applications for

[5] Author's personal communication with experts on South Korean chemical regulation, 23 May 2012 and 29 May 2012; with a non-state actor involved in the process, 4 July 2012.

[6] The term producer is used in this paper in the meaning of including both domestic manufacturers and importers of chemicals because in both the EU REACH Regulation and the South Korean legislative proposal manufacturers and importers of chemicals must comply with the same rules when placing chemicals on the respective market.

registration to the MoE. Chemicals that are designated as subject to evaluation could only be placed on the Korean market if they are registered. Based on the registration data, the ministry would conduct hazard and risk evaluations. In the case of a chemical substance being found to pose a risk to human health or the environment, the MoE could designate it as subject to approval. This means that its producer would have to obtain the approval of the authorities prior to placing the chemical on the South Korean market. The MoE could also restrict or prohibit substances that may severely impair human health or the environment.

Both the EU and South Korea take a comprehensive approach by abolishing the distinction between new and existing chemicals that both jurisdictions' previous laws made. In the EU, the cut off year was 1981 and in Korea 1991. Regulatory provisions address all chemical substances in an equal manner, if they fall into the specific categories such as the volume thresholds and, in the case of South Korea, determinations. The South Korean draft still uses the term new substances but it refers to chemicals that are newly placed on the market and have not been marketed before. REACH uses the label phase-in substance. The equal treatment of all chemicals aims at incentivising innovation because it abolishes the prior incentive to use existing chemicals because they were not as stringently regulated as newly developed chemicals and therefore less costly to put on the market (Scott 2009: 57; Williams et al. 2009: 555).

The EU and South Korea include a broad range of chemicals into the scope of their (draft) laws. The REACH registration requirement includes all chemicals that are placed on the EU market in quantities over one tonne per year per producer. It is estimated that this represents about 30,000 chemical substances (European Commission 2007). The South Korean draft foresees two different types of data submission requirements. All producers would have to submit basic data on the volume and uses of their substances every other year. The minimum volume threshold is one tonne. A South Korean application for registration, which would come closer to the EU registration requirements in terms of the type and extent of data requested, would only have to be submitted by producers of chemicals that are designated as subjects to evaluation and of chemicals that are newly placed on the South Korean market. It is anticipated that the South Korean registration requirement would (initially) cover about

2,000 substances (Fallström Mujkic 2012: 12).[7] The South Korean draft would introduce the concept of application for a registration, which means that the MoE would have to respond to the producers within 30 days to notify them of the result. The MoE could request additional data from the applicant before issuing a notification of successful registration. In the REACH framework, ECHA evaluates the completeness of the submitted registration files but there is no timeline and only (at least) 5% of the registration dossiers undergo a compliance check. The submission of a registration counts as fulfilling the market entry requirement until ECHA detects deficiencies and requests the registrant to submit the lacking data.

2.3 Registration

The REACH Regulation and the South Korean draft Act are based on the principle No Data, No Market. In neither of the two are producers allowed to place their chemicals on the market without prior submission of some data. The establishing of a publically accessible database that centralises most of the registration data – apart from some confidential business information – is a central element of the REACH Regulation. The South Korean draft also includes provisions on the disclosure of registration data, with the limitation of withholding some confidential data. The South Korean draft contains the provision that if data has been disclosed in other countries, it cannot be withheld in South Korea. Both laws provide thus for the possibility to protect confidential business information. The amount of registration data is more ambitious in the EU. The South Korean draft would require producers to submit 46 data items for the highest volume category while REACH requests 62 data items for the highest volume category.[8]

Under REACH, producers must register their chemicals in a staged approach by 2018. The deadline for chemicals placed on the EU market in volumes above 1,000 tonnes per year per producer and for some very hazardous substances was December 2010. For volumes above 100 tonnes per year per producer the deadline is June 2013. All chemicals entering the EU market in volumes above one tonne per year per producer must be registered by December 2018. All producers that pre-registered their chemicals between June and December 2008 can benefit from these staged registration

[7] Author's personal communication with expert involved in the process, 14 June 2012, 19 June 2012; presentation by South Korean chemicals regulation expert, 26 June 2012.
[8] Author's personal communication with experts involved in the South Korean process, 19 June 2012.

deadlines. Otherwise, they must register their chemicals prior to placing on the market. Pre-registration involved the submission of basic data such as the substance name, company information and tonnage band.

According to the South Korean draft, all chemical producers would have to submit to the MoE production and import volumes of the previous two years as well as information about the category of chemical they manufacture or import. The MoE would select and designate substances as subject to evaluation in accordance with standards that would be established by presidential decrees. The application for registration would include the submission of data on the use of the respective substance, its physicochemical characteristics, its hazards and its categorisation. For higher volumes and substances of great concern the data requirements would be more extensive than for lower volumes. The volume ranges that define the data requirement are the same as in REACH.

Joint submissions by a group of producers that place the same substance on the market are included in both (draft) laws. The REACH Regulation and the South Korean draft foresee the joint submission of registration files when the pre-registration shows that several producers place the same chemical on the respective market. In the South Korean draft, joint submissions are obligatory. In the REACH Regulation they are optional, apart from the generation of data that requires animal testing. In this case, they are obligatory. REACH allows for and encourages the joint submission of registration dossiers by producers when they become member of a Substance Information Exchange Forum (SIEF). Those companies not participating in SIEFs must explain their reasons for doing so. The aim of these SIEFs is to avoid duplications in testing, which helps keeping animal testing and costs to a minimum.

2.4 Responsibilities

REACH and the South Korean draft shift the responsibility for generating data from the authorities to the producers of chemicals. Previously, for existing chemicals this responsibility lay on the side of public authorities, which was one of the reasons for the slow progress in conducting risks assessments. Insufficient data on hazards and uses of chemicals made it cumbersome for authorities to gather sufficient data to conduct risk assessments (Biedenkopf and Park 2012: 784). REACH requires extensive data sets and requests that producers conduct testing in case the requested data is not available. The South Korean draft takes a similar approach. In both (draft) laws, producers from

third countries that are not established in the EU / South Korea and that wish to export chemical substances into the respective market are required to have a legal representative in that particular jurisdiction. This so-called Only Representative is legally responsible for fulfilling the regulatory requirements such as submitting the registration data. Alternatively, the EU allows importers of substances to fulfil the REACH obligations.

2.5 Evaluation

Both (draft) laws include evaluation processes in which the registration data is reviewed and assessed with regard to potential risks that would require regulatory responses. The criteria for chemicals to qualify as substances of high concern are virtually the same. Their wording differs only slightly. Yet, only once the South Korean authorities release further details on the specifications of their assessment procedures, would it become clear whether or not there are some more differences.

In the REACH evaluation phase, ECHA checks the registration dossiers for their completeness. More importantly, the competent authorities of the EU Member States evaluate chemicals with regard to potential risks that they might pose to human health or the environment, based on the data submitted in the registration phase. The evaluation can result in different risk management measure such as authorisation, classification and labelling or restrictions. Chemicals that are found to be of very high concern according to specific criteria are placed on an annex to the REACH Regulation, which means that they are subject to authorisation. The criteria for substances to be made subject to authorisation are: a) carcinogenic, mutagenic, toxic for reproduction (CMR); b) persistent, bioaccumulative and toxic (PBT); c) very persistent and very bioaccumulative (vPvB); and d) substances, for example with endocrine disrupting properties, that have an equivalent level of concern to those of other substances listed in the previous points.

Similarly, the South Korean MoE would conduct hazard and risk evaluations of chemicals based on the data submitted through registration. In this process, it would be able to request additional data related to the potential risks of the respective chemical substance. Evaluation could lead to the designation of a chemical as subject to approval if it is found to fall into a specified hazard category. These categories are: a) inducing cancer, mutation or impairment of reproductive functions (equivalent to CMR), b) easily building up in humans, fauna and flora (equivalent to bioaccumulative), c)

residing in the environment for extended periods of time (equivalent to persistent), d) suspected of disrupting humans' endocrine systems (equivalent to endocrine disrupting properties), and e) inflicting an equal or greater level of damage than the other categories (equivalent to equivalent level of concern). The South Korean evaluation criteria resemble the ones applied for substances of very high concern (SVHC) in the REACH framework

2.6 Prioritisation

Both laws prioritise chemicals that are produced in large quantities and of high concern. South Korea would designate chemicals as subject to evaluation, which would then have to be registered, in addition to chemicals newly placed on the market, while for all chemicals on the South Korean market basic data would have to be submitted. In this way, South Korea would initially prioritise an estimated 2,000 chemicals for registration. For substances that are manufactured or imported in volumes above 100 tonnes per year, additional risk-related data would have to be submitted. The REACH registration requirement encompasses all chemicals placed on the EU market in quantities above one tonne per year per producer, which is an estimated 30,000 chemicals. Registration prioritises greater volumes and high concern by applying earlier deadlines and higher data requirements. The last registration deadline is in December 2018 for substance volumes between one and 100 tonnes. The EU evaluation process is also based on a prioritisation. ECHA draws up a so-called Community Rolling Action Plan with the substances that the Member States will evaluate in the following one to two years.

2.7 Authorisation and Restriction

Substances that were found to be of very high concern can be made subject to authorisation in either of the two jurisdictions. The South Korean draft uses the term approval. Producers of substances that are subject to those requirements must receive the authorisation/approval by the authorities before placing the substance on the respective market. In both the EU and South Korea, authorisation requirements are use-specific. Both (draft) laws include the provision that if a safer alternative exists or becomes available, authorisation/approval are not granted or phased out. An application for authorisation under REACH must include an analysis of safer alternatives and a substitution plan. As alternative to the authorisation procedure, the REACH Regulation

as well as the South Korean draft include the possibility to restrict substances that pose an unacceptable risk to human health or the environment through regulatory measures.

2.8 Substances in Products

Producers of products that contain certain substances of very high concern must notify this substance to the authorities in both (draft) laws. The South Korean draft stipulates that producers must declare restricted or prohibited substances that are contained in products. The REACH requirements are different in the sense that substances of very high concern, which were placed on an annex and which are considered candidates for authorisation must be notified if they are present in products in a concentration greater than 0.1% of the product. The South Korean provisions would be specified in a presidential decree. In the EU, full registration of substances in products is required if they are intended for release.

2.9 Communication in the Supply Chain

Both the South Korean draft and the REACH Regulation introduce requirements on the communication in the supply chain. In the EU, information about the risks and safe handling of chemicals must be communicated between the different actors in the supply chain to minimise wrong handling and to promote awareness of the appropriate treatment of the different chemicals (Biedenkopf and Park 2012: 786). Information about the ways in which chemicals are used must be communicated to the producer who registers a chemical. Alternatively, downstream users can register substances themselves if they don't want to communicate their uses to suppliers. The South Korean draft includes requirements on the provision of information to supply chain actors that receive chemicals. This would however only apply to substances designated as subject to evaluation and whose evaluation result the MoE would have communicated.

2.10 Legislative Structure

A fundamental EU-South Korea difference is the legislative structure that underlies the respective (draft) chemical regulation. While the consolidated version of the REACH Regulation spans over 200 pages (excluding annexes), the Korean draft Act comprises about 20 pages. In the EU, a large part of the regulatory requirements is set out in the law itself. Nevertheless, a number of additional technical specifications that were added to annexes and guidance documents contribute to the specification and

implementation of the REACH Regulation. The South Korean draft Act would require a number of decrees, ordinances and rules, which are mentioned in the draft Act.

Similarities	Differences
Comprehensive & systematic approach	South Korean registration would apply to substances "subject to evaluation" (estimated 2,000). EU registration applies to all chemicals above 1 tonne/producer/year (estimated 30,000).
Successive steps: registration, evaluation, authorisation/restriction	South Korea would require producers to submit data on the volume and name of the chemicals they put on the South Korean market every other year. In the EU registration is a nonrecurring event, only if additional data becomes available must producers submit it and if they increase substance volumes so that they trespass one of the tonnage threshold.
No Data, No Market principle	The South Korean MoE would have to respond to registrations within 30 days. ECHA only conducts compliance checks of about 5% of registration dossiers.
Abolition of distinction existing and new chemicals	
Tonnage ranges for registration	The South Korean draft would require producers to submit 46 data items for the highest volume category; REACH requests 62 data items for the highest volume category.
Publically available database with registration data, apart from some confidential business information	
Partial shift of responsibilities to producers	
Prioritisation of high volume and high concern substances	
SVHC criteria: CMR, PBT, vPvB, endocrine disrupters and equivalent concern	
If safer alternatives for chemicals are available authorisation / approval is not granted / phased out	
Communication in the supply chain requirements	
Requirements for substances in products	
Foreign producers must appoint an Only Representative to fulfil their registration and other obligations (or in the EU importers must fulfil the requirements)	

Joint registration	Joint registration is mandatory in South Korea and voluntary in the EU (apart from animal testing).
	EU created ECHA, South Korea would implement the Act with existing institutions.
	The REACH Regulation comprises over 200 pages (excluding annexes) while the South Korean draft proposal has about 20 pages. A large number of detailed provisions would be implemented through decrees, ordinances and rules in the South Korean system.
	In the EU producers had to pre-register their substances to be able to benefit from the staged registration deadlines. The South Korean proposal does not include pre-registrations.

Table 1: Similarities and Differences between the REACH Regulation and the 2012 draft Act on the Registration and Evaluation of Chemicals

3 Policy Transfer and Convergence

The similarities between EU and South Korean chemicals regulation and the timing of South Korean regulatory activities only a few years after the adoption of REACH suggest an EU-South Korea effect. South Korea amended its TCCA five times in the 2000s,[9] the period when the EU REACH Regulation was in the policy-making process[10] and shortly after its adoption. A significant amendment of the TCCA dates from December 2007, one year after the adoption of REACH and six months after its entry into force. The first proposal for a draft Act on the Registration and Evaluation of Chemicals was issued in 2011, only three and a half years after the entry into force of REACH and only a few months after the first REACH registration deadline. This timing suggests that South Korea could have been inspired by or reacted to developments in the EU, in addition to domestic factors driving chemicals policy reform.

Academic literature suggests that policy in one country can affect policy-making in other countries through different mechanisms that follow different rationales and ontological foundations. For the case of EU-South Korea chemicals regulation, a jointly negotiated agreement on the adoption of the respective regulation and the EU exerting

[9] 31 December 2004, 21 February 2006, 27 December 2007, 29 February 2008 and 21 March 2008.
[10] The White Paper on Chemicals was published in 2001, the REACH legislative proposal was issued in 2003 and the Regulation was adopted in 2006.

coercive pressure on South Korea can be excluded as explanatory mechanisms. Two groups of mechanisms were identified to bear the potential to explain possible effects between EU and South Korean chemicals policy. One is based on the economic interdependence between the EU and the South Korean market. Through the interweavement of chemicals manufacturing, chemicals-related industries and consumer markets in both jurisdictions, EU policy can have external effects on South Korea. The second group of external effects is based on the availability of information about and resulting from EU policy, which can lead to learning and emulation by South Korean policy-makers and stakeholders. These two types of external effects are further elaborated in the sections 3.1 and 3.2 below.

South Korean domestic factors are important additional elements to understand the policy output that can result from the EU's external effects. They provide the frame for the type of policy measures that are possible and needed. Factors such as the South Korean industry structure, the capacity of the public authority and public opinion might require different policy measures than the EU situation does. This can explain EU-South Korean differences in the design and scope of chemicals regulation. The domestic factors are further discussed in section 3.3 below.

3.1 Adjustment and Competition

EU policy can have externalities that change the costs and benefits of adopting similar policies in other jurisdictions (Elkins and Simmons 2005: 39-42). Actors in these jurisdictions can respond to the altered situation and adjust their policy positions accordingly. This can lead to increased pressure for the adoption of policy similar to EU policy. Interdependence of markets through trade flows and connected supply chains are condition for transnational effects based on adjustment. When jurisdictions compete with each other to attract internationally mobile capital and business, policy decisions in one of the jurisdictions can make its domestic conditions more or less attractive for investments. Policy decisions in one jurisdiction can thus generate externalities on another that competes for the same investments (Simmons and Elkins 2004: 173; Simmons et al. 2006: 792-95). This dynamic is generally associated with a race to the bottom in which jurisdictions outcompete each other by scaling down social and environmental standards.

International interdependence can however also lead to the trading up of environmental and health standards. Ambitious environmental and health requirements

can create market opportunities for producers that provide compliant products and services. International supply chains and trade can lead to the creation of an incentive for producers to comply with ambitious requirements of a pioneering jurisdiction in order to continue selling products and services on this market (Drezner 2005: 846; Lazer 2001: 476-77). EU policy can thus have a direct effect on extra-EU manufacturers by requiring compliance with EU rules for their activities in the EU market. In some cases, this can trigger further-reaching changes. In complex and globally entangled supply chains, manufacturers can decide to implement the stricter EU requirements to their entire production, not only to the production for Europe. Maintaining one single supply chain, production methods and product design can be economically more viable than separate processes because economies of scale can be exploited.

Compliance with ambitious EU requirements can change cost and benefits of complying with similar rules in extra-EU jurisdictions. Since manufacturers made the initial investment in, for example, product design changes and production methods, the costs of compliance with similar or the same rules in other jurisdictions is significantly diminished. The investment that some extra-EU manufacturers made for compliance with EU rules can also motivate them to support ambitious policy in their home jurisdiction in an attempt to level the playing field with their domestic competitors that are not active on the EU market and therefore not required to make the same compliance investment (Vogel 1997: 562).

The avoidance of regulatory divergence and incompatible regulatory requirements can be a driver for business actors' advocacy in favour of rules similar to the ambitious rules of the jurisdiction that first adopted them. In globalised industry sectors, different requirements increase the transaction costs for companies because they might be required to maintain separate supply chains, product designs and production processes. Global harmonisation of regulatory requirements to minimise transaction cost can be a motivation for business actors to advocate raising regulatory standards to the level of the first mover jurisdiction (Drezner 2005: 846; Kelemen 2010: 336-39; Kelemen and Vogel 2010: 437-50; Lazer 2001: 447). This could be seen as a pre-emptive measure to avoid the adoption of divergent requirements.

3.2 Learning and Emulation

EU policy can also be a model and a source of information for actors from extra-EU jurisdictions. They can learn lessons from or emulate EU policy. State and non-state

actors can use the experience of another jurisdiction in their own policy-making process. These actors can update their policy positions based on the lessons that they draw from information about EU policy. They can analyse policies and related information such as impact assessments, preparatory studies and data produced as a result of policy measures. Lessons from EU policy and EU data can help reduce uncertainties about different policy options (Gilardi 2012; Levy 1994: 290; Weyland 2009: 392-93, 99-401). Learning can span the entire policy cycle from agenda-setting to policy evaluation or take place at one stage of the cycle (for a description of the policy cycle see Howlett and Ramesh 2003: 11-18).

While learning involves the deeper analysis of policy or data from another jurisdiction, actors can also emulate policy originating abroad. Emulation is the support of policy similar to another jurisdiction's policy based on legitimacy and normative grounds. Extra-EU actors change their policy positions in favour of policy similar to EU policy because they share the same norms or because they perceive the EU and its policy as successful. The former is normative emulation, which occurs when actors adhere to the same norms as the EU policy is based upon. Common norms make extra-EU actors assess EU policy as appropriate (March and Olsen 1989: 160-62). The latter is mimetic emulation, which results from the fit of the perceived achievements of EU policy with the goals of extra-EU actors (Finnemore and Sikkink 1998: 901, 06; Shipan and Volden 2008: 842-43).

3.3 Domestic Factors

Some jurisdictions are more receptive to EU effects than others. This can be explained by domestic variables. The overall political agenda, the political majority constellations and the ideologies of relevant actors can make a jurisdiction more or less receptive to effects of EU policy. The more opponents there are to a certain policy, the less likely its adoption becomes (Lavenex and Schimmelfennig 2009: 805; Schimmelfennig and Sedelmeier 2004: 664-65). Culture, norms and traditions that are embedded in a jurisdiction determine what kind of policy is acceptable to the majority. They create a path dependency determining what is considered desirable and acceptable. Formal rules and procedures determine the roles and influence of the different actors involved in policy-making. They are the rules of the games of politics (Gurowitz 2006: 310-11; March and Olsen 1989: 18; Meyer and Rowan 1977: 341).

Structural factors such as the capacity of the regulator to implement legislation, the structure of domestic industry and the existence of a policy problem play another important role in explaining the design and scope of policy output. Extra-EU actors might be affected by EU policy through adjustment, learning or emulation but structural factors can limit their policy design options. Ambitious policy might require a strong and large government agency to implement and enforce the rules. Complex issues require the technical capacity to cope with them. The structure of the economy and especially of the affected sector might preclude some options because they would be too damaging or a certain policy design options might provide opportunities to strengthen certain areas. The existence a policy problem related to the EU policy can contribute to making a jurisdiction more receptive to EU effects. When a jurisdiction faces a policy problem, it is more likely to adopt a policy that targets the particular issue area (Hays 1996: 634-35; Princen and Rhinard 2006: 1121).

4 Links Between South Korean and EU Chemical Regulation

This section demonstrates that the REACH Regulation affected regulatory developments in South Korea. This results from the empirical investigation based on the analysis of policy documents and statements by South Korean officials as well as interviews with experts that are involved in the process. As a result of market interdependence between the EU and South Korea, the REACH Regulation affected the policy positions of South Korean policy-makers and industry actors. Fostering South Korean industry's competitiveness and growth was linked to the ability to comply with requirements that REACH introduced such as data generation and innovation. South Korean policy-makers also learned from and emulated REACH elements. In parts of this process, industry actors played the role of transmitters of lessons learned. Domestic factors in South Korean provide insights into the reasons for South Korean actors to choose policy design elements that differ from REACH and show that adjustment, learning and emulation are conditioned by such factors. In most cases adjustment, learning and emulation will not lead to the taking over of entire pieces of legislation but rather of elements of it. South Korean domestic factors also provide receptive conditions for effects of the REACH Regulation, for example the existence of a related policy problem and the general trend of strengthening environmental policies.

4.1 Adjustment and Competition

The interdependence of the EU and South Korean chemicals markets is strong. EU-South Korean trade in chemicals has intensified in past years. It is one of the areas in which EU exports to South Korean exceed its imports from the country. Table two below shows, that South Korea ranks 13 in the EU's chemical exports and nine in the EU's chemical imports. The share of EU exports to South Korea as part of the EU's total chemical exports is 2.1%. This relatively small number is nevertheless significant since international trade in chemicals takes place to a large extent between the EU and the US and the rest is distributed amongst a number of other countries including South Korea. In 2009, 31% of EU chemicals import came from the US and 28% of the EU chemicals exports went to the US. The second biggest export market for EU chemicals was Switzerland with 9% in 2009. This shows that, besides the US, there are a number of countries including South Korea, which have a small but noteworthy export market share for EU chemicals. Additionally, the EU-South Korea chemicals-related trade is expected to grow in size and significance. A 2010 DG Trade study forecasts that the South Korean production of chemicals and manufactured products is to increase and it predicts that the EU will increase its chemicals exports. South Korea exports significant amounts of manufactured goods such as textiles, clothing, cars and electronic equipment to the EU. These are products in whose production chemicals are needed. Tables three and four below show that chemicals and chemicals-related products such as rubber and plastics but also products in whose production process chemicals are important such as electronic equipment and machinery make up large shares of EU-Korea trade (Decreux et al. 2010). The condition for external effects through adjustment and competition, namely market interdependence, is thus given.

	EU Imports				*EU Exports*				*EU Balance*
Product Group	**Rank**	**Value**	**Share of Product in Total**	**Share of Korea in EU Imports**	**Rank**	**Value**	**Share of Product in Total**	**Share of Korea in EU Exports**	**Value**
2200 - Chemicals	13	2,225 Mio €	6.2%	1.5%	9	5,332 Mio €	16.4%	2.1%	3107.1 Mio €

Table 2: Rank of South Korea in EU Trade, 2011 (source: DG Trade 2012)

Machinery	26.1%
Chemicals, rubber, plastics	**12.6%**
Electronic equipment	7%
Business services	6.8%
Metals	6.3%
Cars, trucks	6.2%
Sea transport	6%
Other manufacturing products	5.1%
Air transport	4.5%
Leather, clothing	2.5%
Trade	2.4%
Other food products	2.2%
Transport equipment	2.2%
Textile	1.8%
Other	8.3%

Table 3: Main EU Exports to South Korea

Electronic equipment	36.1%
Cars, trucks	17.5%
Machinery	15.2%
Transport equipment	7.6%
Chemicals, rubber, plastics	**5.8%**
Textile	3.8%
Business services	2.9%
Metals	2.9%
Other manufacturing products	1.9%
Air transport	1.3%
Leather, clothing	1.2%
Trade	0.8%
Finance	0.8%
Sea transport	0.8%%
Other	1.4%

Table 4: Main South Korean Exports to the EU (source: Decreux et al. 2010)

Considering the market interdependence, South Korean exports to the EU are covered by requirements of the REACH Regulation, which does not only apply to EU chemical producers but also to any other economic actor that places chemicals on the EU market. Chemicals of South Korean origin that are placed on the EU market as substances or in mixtures in quantities over one tonne per year per producer must be registered by 2018 at the latest, depending on their volume. Specific rules apply to chemicals when contained in articles: South Korean manufacturers of, for example, electronic products that contain substances of very high concern must notify these substances if they are included in the candidate list of substances of very high concern established in accordance with Article 59 of REACH. South Korean upstream and downstream users of chemicals must comply with at least some of the communication in the supply chain requirements if they are part of a supply chain feeding into the EU market. South Korean producers can potentially be covered by authorisation requirements, if they sell substances into the EU that are identified as requiring authorisation prior to their placing on the EU market. Because of the market interdependence, a number of South Korean manufacturers are affected by REACH requirements and engage in some compliance efforts (Fallström Mujkic 2012: 12).

Since the EU introduced ambitious and comprehensive requirements for chemicals on its market – which set further-reaching obligations than the South Korean

TCCA – South Korean producers that are part of supply chains feeding into the EU must engage in REACH compliance efforts. This includes activities that are not part of the obligations under TCCA. Awareness of and compliance with the REACH Regulation is an important aspect for Korean chemical producers because a significant share of EU-South Korea trade is directly or indirectly related to chemicals. South Korean exports of fine chemicals to the EU are expected to grow as a result of the 2011 EU-South Korea Free Trade Agreement (FTA) and as a consequence of South Korean expansion in high-tech areas such as nanotechnology (Guerin et al. 2007: 100). REACH is likely to affect most chemicals-related exports to the EU through one or a number of its requirements. Compliance with REACH is important for a significant number of South Korean companies.[11]

Compliance with REACH and the related competitiveness of South Korean companies has been recognised by the South Korean authorities. The South Korean MoE operates a REACH helpdesk[12] that is operated by a REACH taskforce team comprising 12 experts and which was established in September 2006. Their task is to raise awareness amongst South Korean companies, to assist them in understanding their compliance obligations and to support them in implementing compliance measures. Additionally, on the MoE website information about the REACH Regulation can be found.[13] The reason for the establishment of the REACH taskforce and the helpdesk that is mentioned first on the helpdesk website is that REACH "will be the strongest trade barrier among international environmental regulations that have been made".[14] This shows that the South Korean authorities consider REACH compliance an important factor for their domestic industry's competitiveness.

In recent years, imports of chemical substances into South Korea have increased by 20.4% while chemicals manufacturing decreased by 11.3%. For this reason, South Korean officials are concerned about the competitiveness of their domestic chemicals industry.[15] The increase of chemicals imports is attributed to the "slack regulations on

[11] Author's personal communication with a non-state actor involved in the South Korean process, 17 July 2012; with experts involved in the South Korean process, 19 June 2012; presentation by South Korean chemicals regulation expert, 26 June 2012.
[12] See: http://www.reach.me.go.kr/eng/main/main.asp (accessed on 23 October 2012).
[13] See: http://eng.me.go.kr/content.do?method=moveContent&menuCode=pol_hnc_che_man_reach (accessed on 23 October 2012).
[14] See: http://www.reach.me.go.kr/eng/company/purpose.asp (accessed on 23 October 2012).
[15] Author's personal conversation with experts involved in the South Korean process, 19 June 2012.

chemical substance"[16] that make it easy to import potentially harmful substances into South Korea while "major trading partners have strengthened management of chemical substance to protect their people and industry". [17] Boosting South Korean competitiveness is thus connected to the ability of domestic industry to export to the EU and at the same time to keep potentially harmful chemicals out of the country.

The REACH Regulation had effects on South Korean officials and industry actors through market interdependence. This led to the adjustment of these actors' behaviour. Industry engages in adjusting their practices so that they comply with REACH and can continue exporting to the EU. Officials behold the externalities of REACH in terms of competitiveness and as potential trade barriers.[18] REACH led to the adjustment of their policy position so that they advocate reform of South Korean chemicals regulation with the aim of preparing domestic industry for global competition in a context that requires chemicals data, that disfavours risky chemicals and that favours innovation delivering safer alternatives to risky chemicals. The external effects of REACH contributed thus to the agenda-setting process in South Korea leading to the proposal of domestic chemicals regulatory reform.

Adjustment also affected the policy formulation process. The South Korean MoE consulted with industry on the first draft legislative proposal that it issued in 2011. This draft contained a threshold of 0.5 tonnes for applications for registration. In the course of the consultations, industry requested the alignment of the tonnage thresholds with REACH, thus increasing the minimal registration threshold to one tonne and applying the same tonnage bands as in REACH.[19] Market interdependence led thus to the adjustment of South Korean officials' position with regard to the tonnage threshold for registration steering the policy formulation towards compatibility with REACH.

[16] Presentation by the Chemicals Management Division, Environmental Health Policy Office, Ministry of Environment, 23 April 2012. Shared with the author by a representative of the ministry, 25 May 2012.
[17] Presentation by the Chemicals Management Division, Environmental Health Policy Office, Ministry of Environment, 23 April 2012. Shared with the author by a representative of the ministry, 25 May 2012.
[18] Presentation by South Korean chemicals regulation expert, 26 June 2012.
[19] Author's personal communication with experts involved in the South Korean process, 19 June 2012.

4.2 Learning and Emulation

South Korean officials show interest in learning from the EU's experience.[20] In an interview, Jee Yoon Lee, Director of the chemicals management division of the South Korean MoE referred to the South Korean authorities' assessment of REACH and consequent lessons that they drew (Chemical Watch 2011: 25). South Korean officials and European Commission or ECHA officials met a number of times in the past years. For example, a South Korean delegation visited ECHA in May 2012 to discuss various aspects of the preparatory work for REACH (Fallström Mujkic 2012: 12). They showed interest in the pilot project that the European Commission conducted in 2004 and 2005 to test the implications and implementation of REACH. South Korea started similar pilot projects in the summer of 2012.[21] This can be seen as a lesson learned from the EU's preparation for REACH. South Korea also develops guidance for industry. This is another aspect that seems to have been learned or emulated from REACH. ECHA developed numerous guidance documents for industry. A South Korean delegation that visited ECHA in 2011 was interested in the IT tools that ECHA uses for the registration of chemicals. South Koreans and Europeans discussed the use of the same IT tools. There are also some contacts between EU and South Korean officials at the margins of international meetings such as in the OECD context.[22] The strong interest in exchanging information about REACH on the South Korean side is also expressed in the inception of a working group on chemicals by the FTA that the EU and South Korea concluded in 2011.[23] A first working group meeting was held in April 2012 at which general issues were discussed.[24] Details of the meeting are not publically available.

In addition to contacts between South Korean and European authorities, EU chemicals industry closely follows regulatory developments abroad. The European chemicals industry association Cefic and individual companies engage in the South Korean stakeholder process. They met with South Korean authorities and commented

[20] Author's personal communication with a MoE member of staff, 29 May 2012.
[21] Presentation by South Korean chemicals regulation expert, 26 June 2012.
[22] Author's personal communication with European Commission experts, 24 May 2012, 16 May 2012; with expert involved in the process, 14 June 2012, 19 June 2012; with a non-state actor involved in the South Korean process, 17 July 2012.
[23] Article 15.3, Free Trade Agreement between the European Union and its Member States, of the one part, and the Republic of Korea, of the other part.
[24] Author's personal communication with an expert involved in the process, 30 May 2012.

on the draft legislative proposal.[25] A European NGO that focuses on chemicals regulation was involved in some information exchange with South Korean industry and authorities. This dialogue ceased however. NGO-to-NGO cooperation could not be traced.[26] While European industry actors seem to play a noteworthy role in transmitting data to peers and the South Korean authorities, European NGOs seem not involved in contacts with their South Korean peers.

An indication for Korea's openness to cooperation with and learning from other jurisdiction's experiences can be found in TCCA Article 6 (3)5. It stipulates that the Basic Plan for Control of Toxic Chemicals – which the MoE shall formulate – shall include "plans for cooperation with organizations, international organization, etc. relating to toxic chemical control". There is thus the awareness of the importance of international cooperation as well as the willingness to engage with international actors in the context of the current regulatory framework as well as in the context of regulatory reform.

Strong indications that emulation and learning has taken place can be found in the observation that the 2011 South Korean draft proposal contained provisions on a so-called interim registration. This was a registration with lighter data requirements prior to the actual registration, which is an approach that REACH took with its pre-registration provision. In both the 2011 South Korean draft and the EU, pre-registration is not obligatory but it is required if producers whish to benefit from later registration deadlines. Without pre-registration, immediate registration is required. The 2012 South Korean draft does not contain provisions on interim registration anymore. They were removed because the EU experience was ambiguous. The deadlines under REACH were short, which led to a much larger number of pre-registration than anticipated. Companies pre-registered all chemicals due to insecurity of the need to pre-register and the lack of time to gather data. The REACH pre-registration requirement also has an unintended consequence, which occurs in the case that a company decides to use a substance that is already in commerce but that it has not used before. Without pre-registration, a full registration would be required immediately as condition prior to using the chemical. EU industry actors communicated this lesson to the South Korean

[25] Author's personal communication with a non-state actor involved in the South Korean process, 17 July 2012; with experts involved in the South Korean process, 19 June 2012.
[26] Author's personal communication with a non-state actor involved in the process, 4 July 2012.

drafters of the legislative proposal.[27] It appears that they engaged in learning from the EU experience since the provision on interim registration is not contained in the revised 2012 draft. Industry actors seem to have been the transmitters of the lesson. This appears to be a case of initial emulation of the EU pre-registration requirement that was revised based on learning.

4.3 Domestic Factors

South Korean domestic factors explain the country's receptiveness to adjustment, learning and emulation as well as the differences in the draft legislative proposal in comparison to REACH. As discussed in subsection 2.1 above, South Korea faces similar problems to the ones that the EU addresses through REACH. These are, in particular, a lack of data, a slow system for assessing existing chemicals and a low degree of innovation activity. For this reason, South Korean policy-makers recognised the need to design a more efficient and preventive chemicals management system, in addition to the considerations based on adjustment and competition.[28] Given the similarity of the shortcomings of the current South Korean chemical law TCCA with the shortcomings of the pre-REACH regulatory framework in the EU, it appears logical that the drafters of South Korean chemical regulation reform would turn to the EU experience in search for lessons. The existence of a similar policy problem, which is a domestic driver of South Korean chemicals policy reform process, explains parts of the receptiveness to drawing lessons from and emulating EU policy.

South Korea has progressed and significantly expanded its environmental policy since the 1990s (OECD 2006). South Korean environmental and health policy has moved towards the incorporation of precautionary elements, for example in its policy regarding the mad cow disease, which also shifted the burden of proof for safe beef imports from the authorities to the producers (Kim 2012: 10-15). The precautionary principle and shifts of parts of the responsibilities to producer are elementary principles of the REACH Regulation. The reform of chemicals policy falls thus into a more general trend of developing South Korean environmental policy, which provides for a relatively receptive environment for the concepts that REACH is based upon.

[27] Author's personal communication with a non-state actor involved in the South Korean process, 17 July 2012.
[28] Author's personal communication with expert on South Korean chemical regulation, 23 May 2012.

The capacity of South Korean authorities to implement an ambitious chemicals law is a main factor explaining the smaller scope of the draft proposal in comparison to REACH. For the implementation of REACH, ECHA with over 400 members of staff was created. Additionally, the competent authorities of all 27 Member States are highly involved in the process, in particular, in evaluating the risks of chemicals. South Korea does not possess the same capacity being a single country of about 50 Mio inhabitants in comparison to the EU with its 27 Member States and about 500 Mio inhabitants. Implementation of the South Korean chemicals law is foreseen to be conducted by the MoE, other ministries and existing government agencies. This limited capacity, in relative terms, explains the South Korean approach of first requiring the registration of a subset of all chemicals, which is anticipated to cover around 2,000 substances (Fallström Mujkic 2012: 12).[29] The limited capacity also contributes to South Korea's interest in exploiting synergies and cooperating with the EU.

The structure of the South Korean chemicals industry and its declining exports to the EU are another domestic factor that contributes an explanation for reforming chemicals policy. In addition to the related adjustment effects as outlined above, the industry structure also explains some of the differences between REACH and the South Korean draft proposal. The capacity of South Korean companies, most of which are of medium or small size (Guerin et al. 2007: 100) was taken into account, which led to some different requirements than REACH. 99% of South Korean fine chemicals industry are SMEs of less than 300 employees.[30] The South Korean authorities considered the use of the OECD data format IUCLID 5, which the EU uses for its data submission requirements. This IT tool is complex and requires some expertise to use. Concerns arose that the use of the same IT system and data submission requirements as ECHA uses would exceed the capacity in terms of staff and expertise of smaller South Korean companies. For this reason, the South Korean authorities are considering the development and use of a simpler, own IT tool and data format.[31]

South Korea has a hierarchy of laws that is composed of various levels of regulatory measures with the Act on a second level below the constitution and above the

[29] Author's personal communication with a non-state actor involved in the South Korean process, 17 July 2012; with experts involved in the South Korean process, 19 June 2012, 17 July 2012.
[30] Presentation by South Korean chemicals regulation expert, 26 June 2012.
[31] Author's personal communication with experts involved in the South Korean process, 19 June 2012.

levels of presidential decrees, ministerial ordinances etc., as shown in figure one below Acts generally require a number of lower-level decrees, ordinances and rules to be implemented. Together the Act and the lower-level regulatory measures adopted within its framework make up the regulatory regime addressing chemicals (Chemical Watch 2011: 25).[32] This legislative hierarchy differs from the way legislation is designed in the EU and explains some of the differences in the design of the draft South Korean proposal and REACH. The South Korean draft is shorter and does not go into the level of detail that REACH does. Lower-level measures would implement the draft proposal and more provide details of South Korean chemicals regulation.

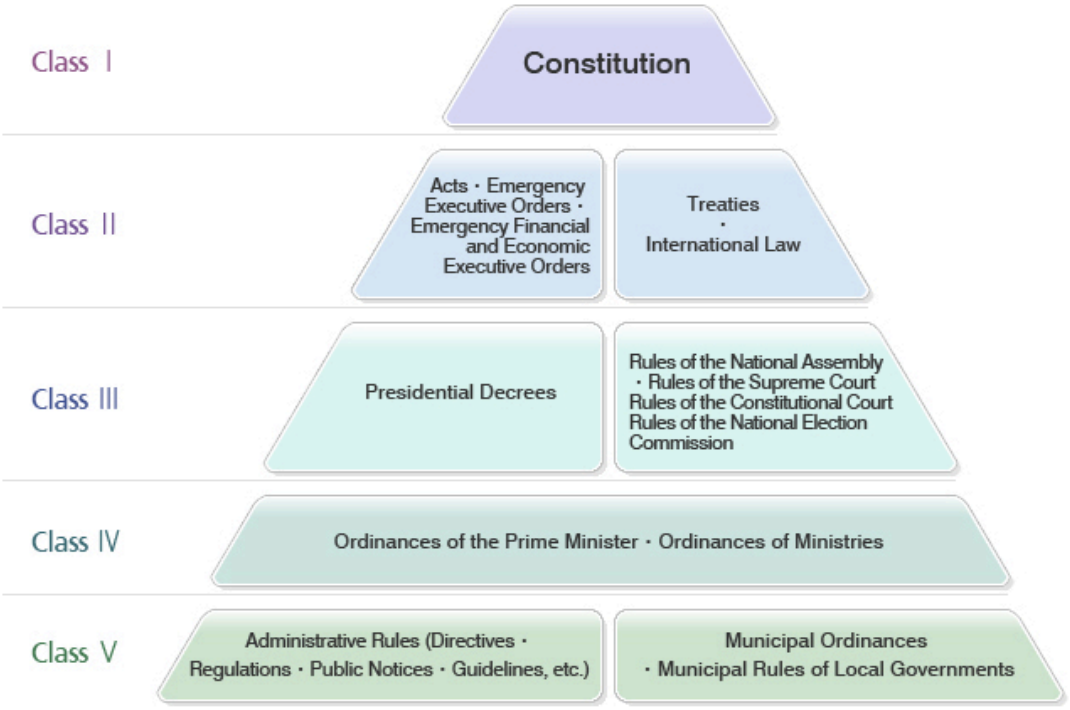

Figure 1: South Korean Legislative Hierarchy
(source: Korea Legislation Research Institute, http://elaw.klri.re.kr/eng_service/struct.do)

5 Potential Areas for Strengthening South Korea-EU Cooperation

This section investigates possibilities for enhancing South Korea-EU chemicals regulatory cooperation. On the one hand, growing trade in chemicals and chemicals-related goods calls for regulatory preparedness on both sides for the respectively other regulatory regime and, on the other hand, chemical policy reform efforts in South Korea seem to make the exchange of experiences and lessons between EU and South Korean

[32] Presentation by South Korean chemicals regulation expert, 26 June 2012.

policy-makers useful. The EU and South Korea could engage in cooperation efforts on two different types of information. The first relates to the regulatory design and the second relates to chemicals data, risk assessment results etc. In the light of the high degree of staff- and expertise-intensity of implementing a comprehensive chemicals management system, observers predict that South Korea is likely to face resource constraints. In this context, the exploitation of synergies and cooperation on the implementation of chemicals regulation appears highly beneficial to both the EU and South Korea. The subsections below outline concrete options for strengthened EU-South Korea cooperation.

5.1 Exchanging Experiences and Best Practices to Foster Learning

While the EU has introduced a fundamental chemical regulatory reform, South Korea is in the process of reforming its chemicals policy. This means that South Korea could learn from EU experiences and build upon them. With the direction in which its reform efforts seem to be moving, South Korea is entering an area that is new for its domestic regulation. Lessons from the EU that went through a similar process could help South Korea avoid some of the flaws and unintended consequences of REACH. While the South Korean capacity and industry structure might require some policy design decisions that differ from REACH, there are a number of elements that the EU adopted and South Korea seems likely to adopt as discussed in detail in section two above. Once both jurisdictions have adopted their chemicals laws, there seems to be a vast array of issues on which both jurisdictions can cooperate to avoid duplications and benefit from each other's work. EU policy-makers could also benefit from lessons from South Korea since the EU is also in a process of implementing, refining and revising parts of its chemical regulation. There is thus still a lot of work ahead on which the EU and South Korean could cooperate and mutually draw lessons from each other.

5.2 Exploring of Options for the Sharing of Data Related to Policy Implementation

The exchange of chemicals-related data could gain importance once South Korea has adopted its Act on the Registration and Evaluation of Chemicals. When South Korea begins requesting data from producers, the format and type of information requested becomes an important aspect. On the one hand, producers will find compliance with South Korean rules less burdensome if they are in the same format and

the same type as they have to submit to the EU, since many companies operate in both markets or are part of a supply chain feeding into both markets. It should be kept in mind, however, that while hazard data remains the same, use data can vary between the EU and South Korea. On the other hand, authorities conducting chemical evaluations could benefit from sharing chemical data and results of risk assessments. Benefits could be achieved by coordinating the selection of substances for evaluation and consequent acceptance of the results. Through such cooperation, economies of scale could be reached. The sharing of data and evaluation results would prevent duplications.[33] It would require a guarantee of the quality and reliability of the results. This could be facilitated if both authorities would work, for example, with laboratories that comply with the OECD Good Laboratory Practices. This would guarantee good quality of the data.

Another concrete way in which cooperation could be facilitated is if South Korea would decide to use the IUCLID 5 data format for its registration processes. In this way the transfer of data between authorities would be facilitated. Chemicals producers invested significant resources in internal IT systems and processes to generate the data that REACH requires. Previous IT systems did not necessarily track the data that is required for REACH registration such as the volume of chemicals.[34] In the light of these investments, aligning the South Korean data requirements, data formats and reporting schedules with what companies have implemented for REACH promises to facilitate the process and to generate efficiency gains for industry and authorities.[35] Yet, as discussed in section 4.3 above, the capacity of South Korean small and medium sized producers to used a complex IT system poses a great challenge and might motivate the MoE to adopt a different, simpler system. In this case, the compatibility of the two IT systems would be an area that EU and South Korean policy-makers could cooperate on in an attempt to avoid unnecessary complications for producers that are active on the EU and South Korean market.

Another aspect of data-related cooperation could be the mutual recognition of registration dossiers at the respectively other authority. This would only work if the data

[33] Author's personal communication with experts involved in the South Korean process, 19 June 2012.
[34] Author's personal communication with a non-state actor involved in the South Korean process, 17 July 2012.
[35] Author's personal communication with expert on South Korean chemical regulation, 23 May 2012

requirements are the same. Data about the toxicity of chemicals is the same in the EU and South Korea and as long as the quality is guaranteed, they are interchangeable. The use of chemicals in manufacturing processes and products can differ between the EU and South Korea. For this reason, use data would still have to be collected separately to cover the respective market.[36] This mutual acceptance is a far-reaching proposal, which would require close cooperation and mutual trust.

5.3 Strengthening Research Collaboration

An additional area of collaboration is between research institutes and testing laboratories. The scientific dialogue and cooperation could be mutually beneficial for the EU and South Korea. Since chemicals management is an extremely complex area, there is a need for scientific research on testing but also on the search for safer alternatives. Joint and mutually complementing research can help use resources more efficiently.

5.4 Developing of a Structure of Formal and Informal Exchange

As discussed above, learning from REACH promises great benefit for South Korea and the EU. Chemicals management is a complex and resource-intensive policy area so that the exploitation of synergies and cooperation seems highly beneficial. The interviews conducted for this paper suggest that an effective dialogue is only in its infancy. An institutional framework that could be exploited for the purpose of effective sharing of experiences and best practices that could support the design of South Korean chemicals policy exists in the form of the working group that was established by the FTA. It met once so far. The stated aim of this group is to exchange information and to cooperate in an attempt to avoid regulatory divergences and non-tariff barriers to trade. Since the minutes of the first meeting are not publically available yet, it is difficult to assess what issues in what detail were discussed. It appears that the discussion remained at a general level. The working group comprises government officials from both sides. For the EU, DG Trade is in the lead but brings in representatives from DG Enterprise and other DGs if required.[37] The working group could provide a good forum for the official exchange of information and for finding solutions for the harmonisation of

[36] Author's personal communication with experts involved in the South Korean process, 19 June 2012.
[37] Author's personal communication with expert involved in the process, 14 June 2012.

regulatory requirements. The challenge seems to be to make efficient use of the opportunity provided by the working group.

Given the complexity of REACH and chemicals management, focused and targeted discussions appear crucial. EU-South Korea meetings promise to be most effective if they focus on specific aspects of REACH or related issues.[38] Depending on the issue, different participants might be chosen. The choice of specific topics enables a deeper discussion of the topic rather than addressing everything related to REACH at the same time. Specific topics could be the different stages of REACH, registration, evaluation and authorisation but more effective seem more specific issues such as IT tools, data submission formats, substance information exchange forums, guidance documents, communication in the supply chain, enforcement, the involvement of stakeholders etc.

However, since the working group meetings take place only once a year or every other year, complementing it with less formalised venues of cooperation seems helpful. In times of intense regulatory activity in one of the two jurisdictions, the demand for information- and experience-sharing can be higher than at other times. Collaboration can take place at different levels of hierarchy and detail. While the exchange of information on broad concepts and fundamental ideas of regulatory design could be discussed in a few high-level meetings, technical details are more numerous, occur more frequently and are dealt with by technical level experts. Cooperation on a more frequent and ad hoc basis appears more conducive in these cases.

Especially, the latter kind of cooperation appears not well developed. It seems however an important point for the coming years since in South Korea subordinate rules to the (draft) Act on the Registration and Evaluation of Chemicals are important. These rules would specify many aspects of the law. For this reason, cooperation in this process appears promising to generate mutual benefit in terms of sharing lessons from the EU with South Korea, working on compatibility and minimisation of trade barriers. This seems likely to be situated at the level of experts in the administrations rather than at the higher political level. In addition to the design of regulation, coordination on the implementation and enforcement of regulation could be beneficial.

[38] Author's personal communication with expert involved in the process, 14 June 2012.

A concrete step that could help fostering closer and more efficient cooperation between South Korea and the EU on chemical regulation could be the designation of a regulatory cooperation person in ECHA, DG Enterprise, DG Environment, the Korean MoE and other Korean authorities involved. These persons would be tasked to be the contact point for outside requests from their counterparts, they would be in charge of promoting awareness of chemical regulatory developments in other jurisdictions and they would put individual experts in contact with their counterparts in other bodies. So far, it seems that funding for such positions is limited in the EU institutions. ECHA has an international outreach manager but it seems that the resourcing is relatively restricted. ECHA's workload with regard to the implementation of REACH is high. For activities that are not part of ECHA's legal requirements, which would be many of the cooperation activities, there are no resources available.[39] In the context of current budgetary discussions, it seems unlikely that additional resources would be made available.

The EU and Korea could consider signing a Memorandum of Understanding (MoU) on the sharing of knowledge, experience and best practice on matters of mutual interest. Such an agreement would frame the above-described cooperation into a mutually expressed willingness at high political level. Such a MoU could provide the grounds for instruments of enhanced cooperation such as regular meetings at different hierarchical levels. Yet, the establishment of the working group on chemicals by the FTA fulfils this role partially. In the case of efficient implementation of the intention behind the working group and of increased informal contacts at different levels of the hierarchy, a MoU might not be necessary. It could however help setting the process in motion by demonstrating a high-level political commitment that is specifically targeted toward chemicals regulation.

5.5 Including EU Member States

EU-South Korean cooperation on the evaluation of chemicals would only work if Member States were included. Under REACH, the competent authorities of the Member States conduct the assessment of chemicals in the evaluation stage. ECHA is involved in the compliance checks of the dossiers, in the testing proposals, in the selection of chemicals for the Community Rolling Action Plan of substances to be

[39] Author's personal communication with a non-state actor involved in the South Korean process, 17 July 2012; with expert involved in the process, 14 June 2012.

evaluation by the Member States and in managing the processes. ECHA conducts some risk assessments when preparing restriction dossiers but many technical risk assessments are conducted by the Member States. For this reason, their involvement in parts of the EU-South Korea cooperation should not be neglected.

6 Conclusions

This paper started from the observation that the EU has fundamentally reformed its chemical regulation in 2006 and that South Korea is currently in the process of introducing a significant chemicals regulatory reform. Both (draft) laws expose significant similarities but also some differences. These similarities appear to be a (partial) result of market interconnectedness, mutual awareness and lesson-drawing. Regulatory cooperation between South Korea and the EU, as opposed to a one-sided or non-steered process, was found to be in its infancy. It is relatively ad hoc and patchy. There seems to be scope for enhancing cooperation at all levels of hierarchy. The working group on chemicals that was established through the FTA is a start and demonstrates the recognition that regulatory cooperation is important. It has the potential to provide a formal framework for strengthened EU-South Korea cooperation.

However, in an attempt to further enhance and foster cooperation, additional structures and personal links are needed. These do not need to be highly formalised but a designated person in the main involved institutions would help setting up and fuelling such dialogue. Such persons could act as link-makers between technical and regulatory experts in South Korea and the EU. Large parts of regulatory cooperation depend on the persons that deal with detailed policy-related questions and their implementation rather than on high-level political appointees. The high-level political commitment seems an important component preparing the grounds for regulatory cooperation but it is equally or even more important that the individuals that work on the policy on a day-to-day basis fill the political commitments with concrete actions. This paper outlined areas in which and options for how this could be done.

The early stage of South Korean chemical policy reform provides a good opportunity for cooperation at an early stage of the policy cycle. This could help avoiding the creation of barriers to trade and regulatory differences, which would be more difficult to iron out at a later stage of the process.

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