



EU and Global Impact Analysis Methodology

Date: 03.03.2020

Version: 1.0

Work Package 2: Strategies and Methodologies

Deliverable 2.2: EU and Global Impact Analysis Methodology



The WasteForce project is funded by the European Union's
Internal Security Fund – Police (ISFP/2017/AG/ENV/821345)

EU and Global Impact Analysis Methodology

This report is produced as a deliverable for the work package 2.2 of the WasteForce project.

Deliverable 2.2

EU and Global Impact Analysis Methodology, in which existing methodologies for impact assessment of changes in policies, markets or legislation affecting the waste trade and management at EU and Global level will be collected and analyzed.

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 - European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL)
 - Environment Agency England
 - with inputs from all partners
-

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1 Background

With well-established waste management industries and access to open markets, different types of wastes are shipped globally as commodities. Resource and value recovery – including material recycling and energy recovery – is often the main driver of these waste trades. The types of waste that are shipped across borders include virtually all types of waste fractions – from common household wastes to end-of-life vehicles, material recyclates from waste sorting facilities, bottom ash residues from waste incineration plants, and special fractions such as radioactive waste residues requiring safe disposal/storage.

Non-hazardous waste fractions are often shipped for resource recovery purposes (including recycling and energy recovery). Waste fractions containing valuable resources such as metals and high quality plastics that can be recovered as material or energy go through some form of processing before being shipped. This is essential for creating value by concentrating of sellable material fractions and complying with national and international shipment legislations for the particular waste stream. Paper and metals are the major non-hazardous waste streams that are shipped across borders, each amounting to 8-10 million metric tons (Mt) for 2005 originated from the EU and mostly headed to the Far East (ETC/RWM, 2008). Between 2010 and 2014, the EU shipped up to €10 billion worth non-hazardous waste to non-OECD countries every year¹. In some cases, special waste types have to be transported across borders for their proper management or disposal that require special treatment and/or disposal such as radioactive waste, residues for landfilling, and hazardous wastes.

Transboundary trade of waste fractions facilitates optimal management of waste through resource recovery and proper disposal of residual wastes making use of the international network of facilities. However, with the growing amounts of waste shipped internationally it is also believed that illegal shipments of wastes have also grown significantly in recent years. These illegal shipments are driven mainly by profit margins for involved actors in destination countries as well as by the high compliant recycling cost in source countries. Illegal trafficking of waste can have not only implications for the environment and human health, but also negative effects on legal trade and economic completion (Rucevska et al., 2015).

Several policies at national, regional and international levels have been introduced to address the issues linked to waste shipments. They include the Basel Convention (The Basel Convention, 1992), OECD Decision 2001 and The European Waste Shipment Regulations (WSR, 2006). However, even in the presence of these regulations, significant amounts of illegal waste shipments are occurring across the European borders and beyond. While the majority of the waste shipments are for resource recovery, estimates suggest that 25% of the overall shipments do not comply with the regulations². It is not clear whether, and if yes, to what extent, these policies have affected the trend of illegal waste shipments across EU and across the globe.

¹ <https://ec.europa.eu/trade/import-and-export-rules/export-from-eu/waste-shipment/>

² <http://ec.europa.eu/environment/waste/shipments/index.htm>

In this context, this work reviews the EU and global impact analysis methodologies. It analyzes existing methodologies for impact assessment of changes in policies, markets and legislative changes affecting the waste trade and management at EU and Global level.

2 Scope and Methodology

This report looks into the impacts of policies linked to waste shipments and management and studies how these impacts are analyzed in relation with the policy instruments. In particular, it seeks to identify modalities of policy impact assessment in the waste sector with a focus on transboundary shipments and management. Finally, it aims to propose improved and more comprehensive frameworks for evaluating policy impacts for the sector of waste shipment and management. Thus, the main objectives of this report are

- a) to analyze existing impact assessment methodologies for policy changes linked to waste trade and management, and
- b) to propose improved and integrated models to predict the impacts of future policy changes.

In order to achieve these objectives, we review the cases of e-waste and plastic waste. These waste streams are chosen mainly because of two reasons. First, they have seen a rapid growth in quantities during last decades and have attracted a lot of attention in the growing discussion of resource sustainability and in the concept of circular economy. Second, there have been several changes in policies at national, regional and international level regarding the transboundary movements of these two waste streams.

Four major policy interventions at EU and global level covering these two waste streams are studied. These include a) the European Waste Electrical and Electronic Equipment (WEEE) Directive, b) the Waste Shipment Regulation (WSR), c) the Chinese Ban on waste import, and d) the recent amendments, proposed by Norway, to the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal. This report evaluates the existing works on policy impact assessment, mainly focusing on the methodology used to evaluate the policy impacts. The overall scope of the work is illustrated in Figure 1.

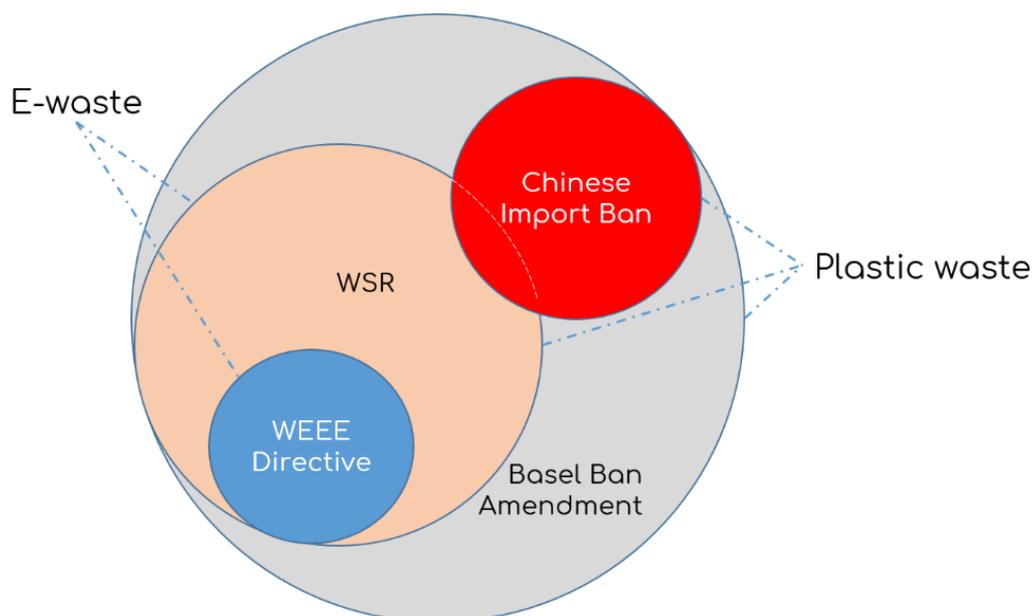


Figure 1 Geographical and material/waste type-scope of the policies considered for case studies

2.1 Waste Fractions

2.1.1 E-waste

E-waste has been on the spotlight of the discussion on transboundary movements of waste – both legal and illegal. Only 20% of the 50 Mt e-waste generated globally is collected and treated under the official system, which leaves the large fraction to be dealt with by the informal and illegal handling (Baldé et al., 2017). The main issues linked to the transboundary e-waste flows include management of hazardous substances and improper processing of e-waste resulting in losses of valuable resource. Often the illegally shipped waste streams are processed by the informal sector, which also means the loss of business opportunities for actors in the formal waste management sector in both origin and destination countries. In addition, the informal waste processing practices are linked to environmental and human health related issues in the destination countries.

Reuse is often stated as the goal of shipping used electronics from industrialized countries (USA, EU, etc.) to developing economies (China, Africa, etc.). Although many products are shipped as used items with some reuse potential, a part of the items may not be reusable. They are often illegally disguised as functional items and shipped to destinations in East Asia and Africa from the EU. Nigeria in 2010, for example, received 100 kilo metric tonnes (kt) of non-functional electronic items (basically e-waste) which was 30% of the total ‘used items’ imported (Ogungbuyi et al., 2012). For comparison, the Netherlands exported 44 kt of used e-products in the same year (Huisman et al., 2012).

The assessment from Geeraerts et al. (2015) concluded that “A large part of the unreported, but collected, WEEE may either be treated in the EU without due environmental care or illegally shipped to developing countries where parts of the valuable material are recycled in ways dangerous to the health and environment, or dumped”. Figure 2 illustrates the global e-waste generation with highlights of the so-called ‘unfair flow’ to less developed countries.

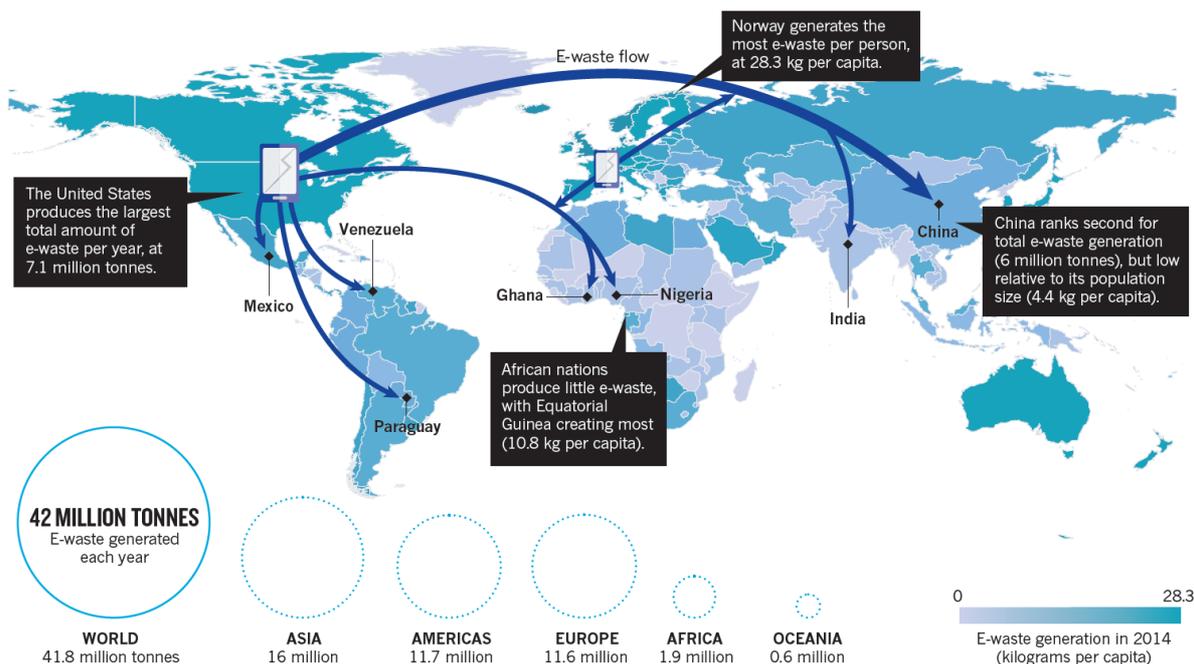


Figure 2 China processed around 70% of the world’s e-waste in 2012 [Source: (Wang et al., 2016)]

2.1.2 Plastic Waste

Around 350 million metric tonnes (Mt) plastic was produced in 2018 globally compared to 1.5 Mt in 1950 (PlasticsEurope, 2019; Velis, 2017). The amount of plastic wastes collected and traded globally for material and energy recovery grew from 15 Mt in 2007 to 45 Mt by 2015, which is still only about 15% of total plastic production. This indicates that only a small fraction of the plastic waste is traded across boundaries for resource recovery.

Less than 20% of the global plastic (~65 Mt) is produced in Europe, of which 40% is used for packaging. The main source of plastic waste is the post-consumer plastic, especially coming from municipal waste collection. More than 8 Mt of plastic waste was collected in the EU for recycling in 2016 (PlasticsEurope, 2019). Out of the collected plastic waste, almost half was exported outside the EU of which 87% going to China directly or via Hong Kong (Velis, 2017).

Besides the EU, China has also been the destination for plastic waste originating from other OECD countries including USA, Canada and Japan as the major exporters. China received 56% of global plastic wastes with the quantity increasing from about 6 to 9 Mt between 2006 and 2012. This pattern was disrupted with the introduction of the ‘Green Fence’ operation by China in 2013 that was aimed at increasing the quality of imported plastic wastes as well as reducing illegal flows (Brooks et al., 2018). Following a decent success of the initiative, China announced a complete ban of select nonindustrial plastic waste as part of the ‘National Sword’ initiative in 2017.

Figure 3 shows the plastic waste import trends into China up until 2016. This trend, however, has been further disrupted after the introduction of the new policy with its effects felt by the plastic waste traders as well as other stakeholders globally within the first two years.

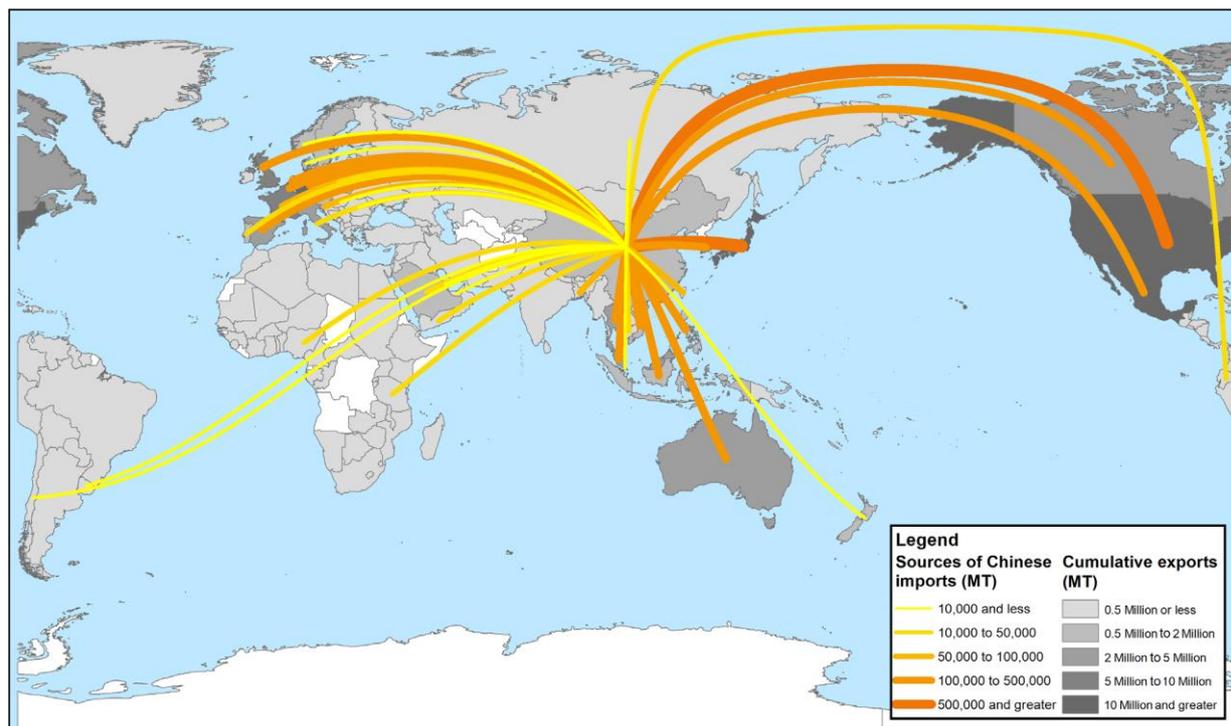


Figure 3 Plastic waste import to China (cumulative quantity for 1988-2016 & flow in 2016 in metric tonnes)
[source: (Brooks et al., 2018)]

2.2 Policies

2.2.1 WEEE Directive (2003)

The Waste Electrical and Electronic Equipment (WEEE) Directive was aimed at preventing as well as reducing the disposal of e-waste by promoting reuse and recycling (European Parliament, 2003). It required the EU member states to establish a separate system for collection and treatment of household e-waste along with the reporting of the amounts collected and treated. It allows the shipments of e-waste for treatment operations when complied with the Council Regulation (EEC) No. 259/93 of 1 February 1993. The recast of WEEE Directive (2012) mandates the Member States of the European Union also to “ensure that shipments of used EEE suspected to be WEEE are carried out in accordance with the minimum requirements and monitor such shipments accordingly”.

2.2.2 Waste Shipment Regulation (2006)

The primary goal of the EU Waste Shipment Regulation (WSR) introduced in 2006 was to address the uncontrolled flows of waste across borders, which implements the provisions of the Basel Convention including a ban on export of hazardous waste to non-OECD countries and a ban on export of waste for disposal. The WSR provides the basic rules (two procedures) for controlling transboundary movement of waste shipping and transiting between EU as well as non-EU countries. The control producers include general information requirements (Art. 18) for waste streams for recovery purposes (so called “green” listed waste – non-hazardous waste) and prior written notification and consent for waste designated for disposal and for recovery purposes (so called “amber” listed waste – exhibit

hazardous properties and unlisted waste – waste which is not listed on any of annexes). The regulation was amended in 2014 to strengthen inspection systems for the shipment of waste with a plan to apply the changes by 2017. The WSR is currently being evaluated by the European Commission with a deadline of 31 December 2020.

2.2.3 Chinese Import Ban (2017)

China has been the global destination for various waste streams that have recycling potential including packaging waste, metal scraps, plastics, and e-waste. China was taking in more than half of the global plastic waste. In 2017, the Chinese government announced, as a part of the 'National Sword' campaign, the plan to impose bans on 24 types of waste streams including plastics in packaging waste. As a result of this new policy, an average of about 8 Mt of plastic waste per year is estimated to be displaced globally over the next decade (Brooks et al., 2018). China announced bans also for years 2019 and 2020, for each year 16 new types of waste (mixed metal scrap, plastic scrap from industrial sources, etc.)

2.2.4 Norwegian Amendment of the Basel Convention (2019)

The Basel Convention on the Control of Transboundary Movements of Hazardous Waste and their Disposal (adopted in 1989) requires worldwide notification for the movement of hazardous waste between countries. Signatories to the Convention are also required to ensure a sound management of such waste in order to avoid its adverse impacts on human health and the environment. The main aims of the Convention are: a) Reduction as well as environmentally sound management of hazardous wastes, b) Restriction of transboundary shipment of such waste except when sound management is guaranteed, and c) Regulatory system for the transboundary movements.

A global discussion on how to address the plastic problem was fueled in part by the Chinese import ban. As more and more plastic waste ends up in the nature (especially oceans), there have been calls for classifying plastic wastes as hazardous based on the fact that plastic debris, if not managed properly, can pose physical as well as chemical harms to wildlife (Rochman et al., 2013). Norway proposed, and the BRS Triple COP approved in June 2019, an amendment of the Basel Convention (Article 17) concerning plastic waste. The Norwegian amendment includes changes in Annexes in order to promote the trade of clean plastic waste and more stringent requirements for mixed and contaminated waste streams.

3 Policy impact assessment

A policy generally refers to objectives and actions in relation to a political issue and can be in the form of strategic plans, legislation, public interventions, financial incentives, etc. that are expected to change the behavior of a target group in order to bring about the desired changes (EEA, 2016). Policy impact assessment (PIA) is aimed at bringing scientific evidence to the attention of decision makers using evaluation and prediction of potential impacts of different policy options (Adelle and Weiland, 2012). It is one approach to support the development of evidence-based policies and monitoring their implementation (Gertler et al., 2016). Policies are evaluated for their performances and impact assessments (as well as evaluations)³ are a part of the policy cycle (Figure 4) in public management that serves two purposes (OECD, 2014):

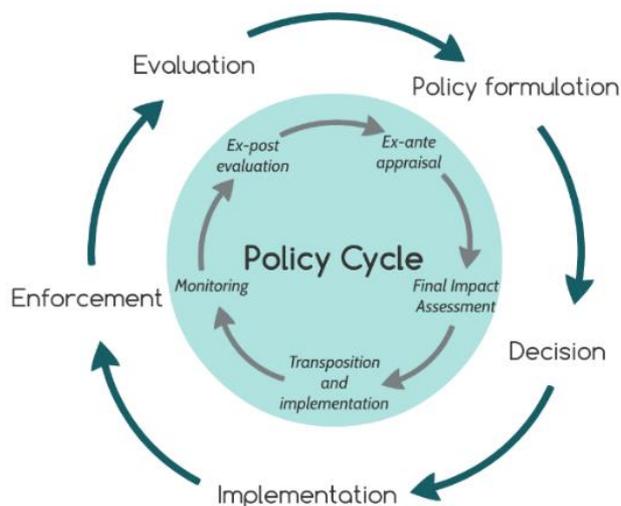
1. It is equivalent to policymakers’ business planning and a part of needs analysis and planning activity of the policy cycle that prospectively analyses the anticipated impacts of an intervention (*Ex ante*)
2. It is an evaluation mechanism to measure the effects of an intervention including a wider range of issues (e.g. cost, efficiency, and the unintended effects of an intervention), which is a part of the evaluation and management activity of the policy cycle (*Ex post*)

Impact assessment and evaluation are part of the policy implementation cycle, and are generally commissioned by the owners of the policies themselves. They are instrumental for understanding the various policy options available to tackle a particular issue before devising a policy as well as in analyzing the functionality of implemented policy instruments with respect to the desired goals.

Figure 4 Stages of a policy cycle (outer circle) and corresponding tools (inner circle).

Both impact ‘assessment’ and ‘evaluation’ are part of the policy cycle

[reproduced from (OECD, 2019)].



³ The term impact assessment is understood to have a narrow focus (on pre-defined set of impacts) whereas impact evaluation means a broader approach to cover a wider range of issues. For simplicity, this report uses these terms as well as ‘impact analysis’ to have the same meaning and are therefore used interchangeably.

3.1 Methods of PIA

In broader terms, impact assessment methods can be grouped into two categories: a) Theory-based Impact Evaluation (TBIE) and b) Counterfactual Impact Evaluation (CIE) (INTERact, 2016). Figure 5 provides an overview of these methods. Theory-based Impact assessment involves establishing a ‘theory of change’ – a description of the ‘cause and effect’ from an intervention to its desired effects (Gertler et al., 2016). Counterfactual analysis compares what would have happened in the absence of an intervention, to actual outcomes occurring with the intervention. It can also compare the results of a particular intervention with those of a different intervention (White and Raitzer, 2017). Several tools for impact assessment exist, with assessment tools such as cost-benefit analysis, scenarios analysis and computer modelling (Adelle and Weiland, 2012).

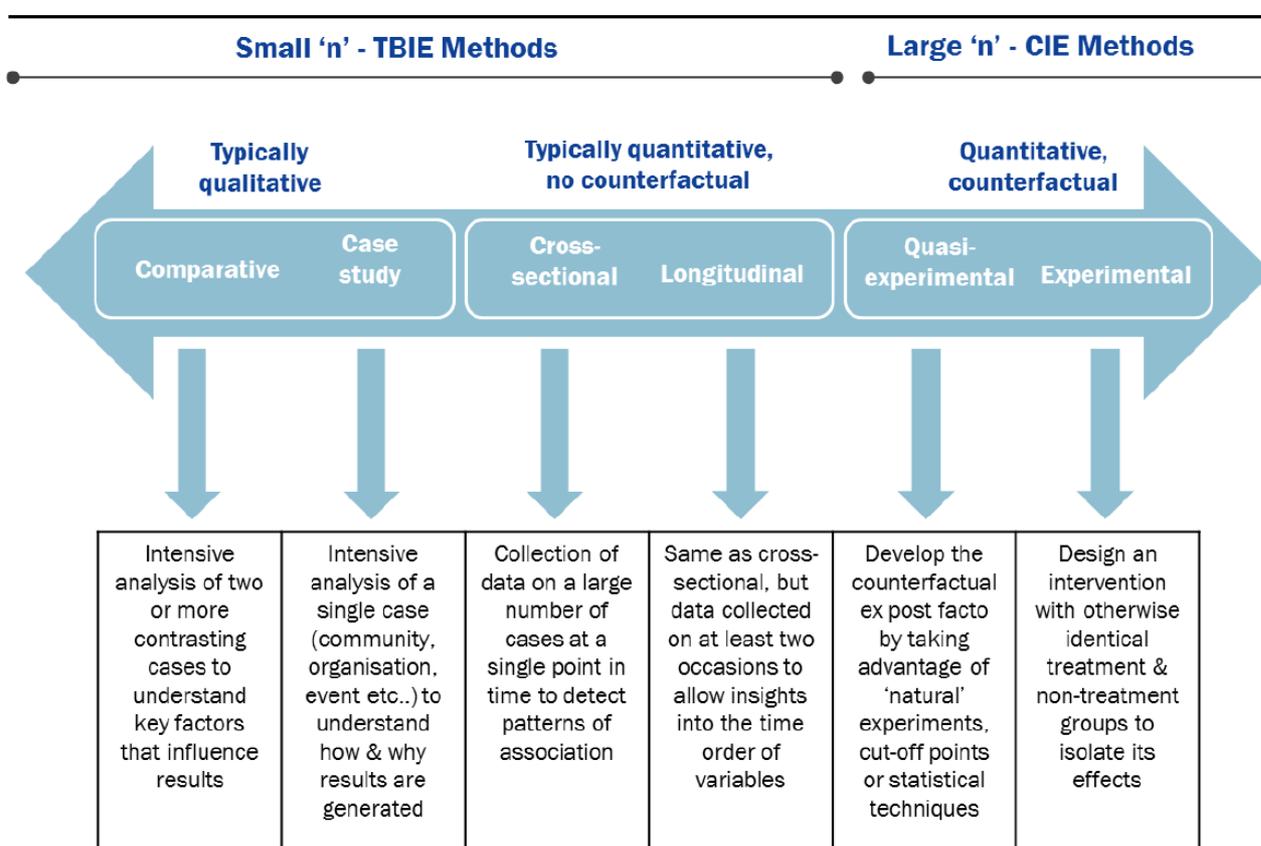


Figure 5 Typical approach and purpose of different impact evaluation methods [source: (INTERact, 2016)]

3.1.1 Theory-based Impact Evaluation (TBIE)

In a theory-based impact evaluation (TBIE), ‘theory’ refers to the hypothesis that is made in order to explain how a particular policy program will work (INTERact, 2016). The TBIE methods often rely on the qualitative analysis that builds on either a single case study or comparative studies of two or more cases in order to understand the impacts. This method is particularly of importance in situations where quantitative and statistical tests are not feasible because of, among other reasons, small sample size and constraints of resources available. Although these TBIEs may not be as robust in terms of offering statistically valid numbers to

reflect the policy impacts, they can offer an important causal interference to evaluate the impact.

Theory of Change is one of the important TBIE concepts that takes a logic chain to predict how a policy will perform. According to Gertler et al. (2016): “A *theory of change* is a description of how an intervention is supposed to deliver the desired results” (Gertler et al., 2016). It describes the causal logic of how and why an intervention is expected to bring about the anticipated results. The approaches of depicting a theory of change involve the basic elements of a) a causal chain, b) a specification of outside conditions and influences, and c) key assumptions. The steps required in preparing an assessment using this method are illustrated in Figure 6.

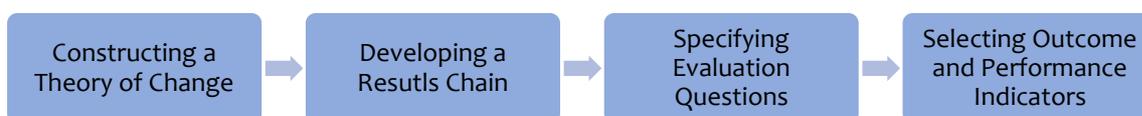


Figure 6 Steps involved in impact evaluation based on a theory of change

3.1.2 Counterfactual Impact Evaluation (CIE)

Counterfactual Impact Evaluation (CIE) is used to investigate whether an intervention made any statistically significant difference to specific outcome compared to alternative scenario with no or another intervention by the means of a counterfactual analysis (White and Raitzer, 2017). Counterfactuals maybe logically constructed (for example, by using reasonable assumption to estimate a baseline) or statistically created. This method of PIA is better suited for situation where the total population is large enough and there are enough resources available to allow the experimental evaluation approach.

Determining whether a policy is the cause of an effect is an important but not always an easy task. This is even truer for CIE, which relies on statistical tests in order to determine the effect of a policy initiative in treatment groups (compared to controlled groups or modelling using predictor variables). The most common CIE methods include: a) differences in differences, b) regression discontinuity design, c) instrumental variables, and d) propensity score matching (Crato and Paruolo, 2019).

3.2 PIA practices in the EU

The European Commission has a commitment, as a part of its Better Regulation agenda, to plan, adopt, design, implement, enforce, evaluate, and revise all EU interventions including legislative or non-legislative, spending, and other measures to ensure their highest possible quality (European Commission, 2015). It has set standards and guidelines for a quality impact assessment and recommends a careful planning and sufficient time to achieve the desired quality. Regarding the need of a PIA, the European Commission’s document ‘Better Regulation Toolbox’ states:

“An Impact Assessment (IA) is required when the expected economic, environmental or social impacts of EU action are likely to be significant.” (European Commission, 2015)

Better regulations also mean design and implementation of effective policies at a minimum cost. When it comes to environmental policies, demonstrating the worth and merit of any

regulation is even more important (EEA, 2016). The knowledge gathered from the evaluation of existing policies can help development and improve the quality of new environmental policies.

The policy evaluation framework developed by the European Environment Agency (EEA) takes into account elements including inputs, outputs, impacts, results, external factor and other policies, and evaluates an intervention based on four key criteria – relevance, effectiveness, efficiency and coherence. Figure 7 shows the EEA's policy evaluation framework.

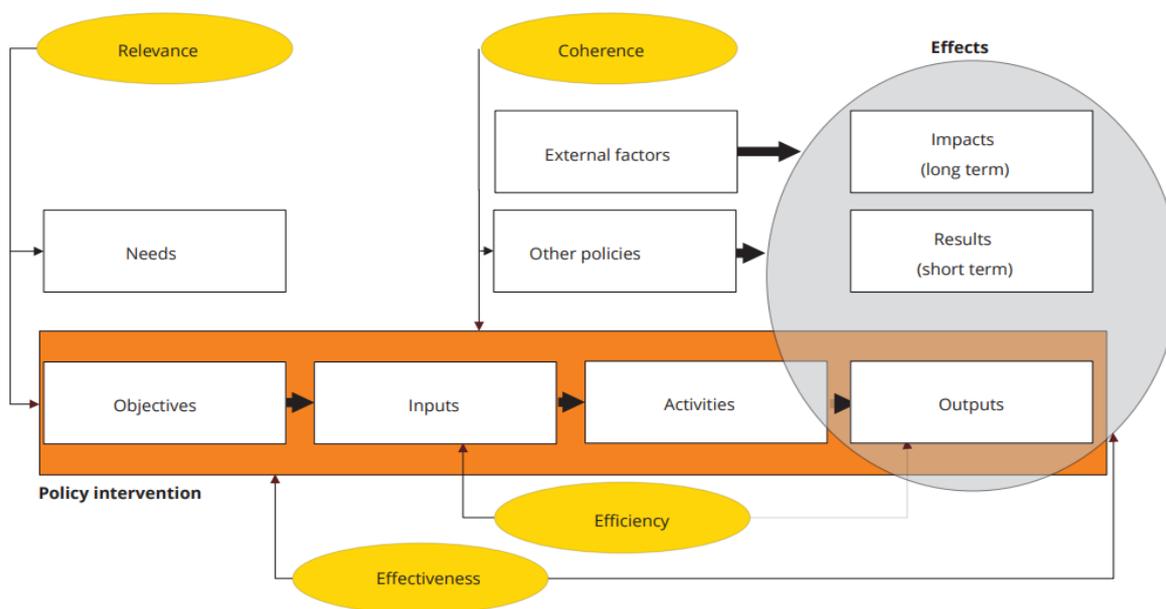


Figure 7 Policy evaluation framework by EEA (EEA, 2016)

The yellow balloons represent the criteria for evaluation, which are described by the EEA (2016) as following:

Relevance:

- To what extent do the (original) objectives (still) correspond to needs and issues?

Effectiveness:

- To what extent did a public intervention cause observed effects and changes? To what extent do the observed effects correspond to the objectives?

Efficiency:

- Were the costs involved justified, given the changes and effects achieved?

Coherence:

- External coherence: To what extent is a public intervention coherent with other interventions?
- Internal coherence: To what extent is the public intervention coherent internally?

4 Case studies

In this section, past examples of policy impact assessment (mainly concerning WSR and WEEE) are analysed. An illustrative study approach is taken in order to familiarize and compare the available cases of policy evaluation. One evaluation of the WEEE Directive (from 2008) and two evaluations of WSR (one from 2013 and another ongoing), all conducted by the European Commission, were reviewed for this purpose. The analysis is presented in the following format:

- a) A summary of the evaluation including its objective and outcomes; and
- b) Strengths and weaknesses of the methodologies used by the PIAs.

In case of the two other case policies (Chinese ban and Norwegian amendment), which are more recent and are yet to be systematically assessed for their impacts, anecdotal evidence is collected in order to suggest hypothesis and for comparison with other policies. It is based on the analyses of immediate impacts of these policy instruments and reaction to them from concerned stakeholders.

The learnings from these case studies are presented collectively in Chapter 5 with a focus on PIA methodologies. Finally, Chapter 6 summarizes the findings and proposes measures for strengthening the EU and Global PIA approaches based on the evidence from the recent developments in the sector of waste management and trading.

4.1 WEEE Directive

The European Commission assessed the impact of the WEEE Directive in 2008 (European Commission, 2008), which has served as the foundation for the WEEE Directive recast in 2012. The assessment was mainly focused on ‘Effectiveness’ and ‘Efficiency’ of WEEE Directive. A thorough quantitative analysis as well as consultation process was used for reviewing the implementation, which took three years to complete. **Table 1** below summarizes the IA.

Table 1 Summary of the WEEE Directive impact assessment

Key objective	“to solve problems with the effectiveness and the efficiency of the Directive”
Objectives	Ensure proper treatment of collected WEEE, Reduce WEEE going to landfill, Remove unnecessary costs in doing this, Promote low-skilled employment, Support high-tech innovation and export growth
Method	Several options were considered, and after filtering out some of them through a stakeholder consultation process, a few were selected. Each of the selected options were analysed for the economic, environmental and social impacts.
Outcome: Costs and benefits were analysed quantitatively based on:	Six options to improve the Effectiveness 1 – Take no action 2 – Introduce minimum legal requirements for inspections of WEEE treatment 3 – Introduce minimum inspection requirements for waste shipments 4 – Increase the collection targets (85% of WEEE arising), make producers responsible for this target and include B2B equipment in the scope of the collection target

<ul style="list-style-type: none"> - Cost of WEEE collection and treatment as well as enforcement cost, and - Benefits in terms of avoided environmental damage 	<p>5 – Set a 100% collection target on the environmentally most relevant streams</p> <p>6 – Envisage collection targets set in relation to EEE put on the market in the preceding year</p> <p>and another eight options to tackle Efficiency</p> <p>1 – Take no action</p> <p><i>To clarify scope and categorisation (alternatives):</i></p> <p>2 – Clarifying the scope by using fixed lists of products</p> <p>3 – Defining the scope under the RoHS Directive</p> <p>4 – Classifying categories of equipment</p> <p><i>To cut administrative burden from registration and reporting (alternatives):</i></p> <p>5 – Inter-operability of national registers and harmonisation of reporting requirements</p> <p>6 – EU operated Register</p> <p><i>Other</i></p> <p>7 – Include the reuse of whole appliances in the components, material and substance reuse and recycling targets</p> <p>Option 8 – Include recycling and recovery targets for medical devices</p>
Indicators of progress	Cuts on administrative burden, Effectively achieve the Directives aims, Separate collection/treatment of WEEE
Recommended options	To improve Effectiveness: 2, 3, 4, 6 To improve Efficiency: 3, 5, 7, 8
On Coherence	Mainly considered the goal of supporting the recycling industry in the EU RoHS, REACH, EuP

The strengths and weaknesses of the methodology used for this assessment are summarized in **Table 2** below.

Table 2 Strengths and weaknesses of the methodology used for WEEE Directive’s PIA

Strengths	<ul style="list-style-type: none"> - Thorough and comprehensive - Evidence-based, used mixed methods – both qualitative and quantitative evaluation - Some of the recommendations made it to the WEEE recast (e.g. collection and recycling targets based on amount of put on market EEE)
Weaknesses	<ul style="list-style-type: none"> - Coherence & relevance not included - More focus on costs, although other aspects were investigated in detail

4.2 WSR

4.2.1 EC 2013

The EC conducted an impact assessment of the WSR in 2013, which examined options to “strengthen the inspections and enforcement of the WSR in order to effectively prevent illegal waste shipments” (European Commission, 2013). The options were evaluated through a consultation from stakeholders. Each option was assessed based on its costs, benefits, and

‘how does the option solve the problem’. The costs included implementation costs (personnel, hardware etc.) whereas the benefits considered were economic benefits, employment impacts, market implications.

Table 3 Summary of the WSR impact assessment (2013)

Key objective	“The protection of the environment and health by reducing illegal waste shipments”				
Objectives	<ul style="list-style-type: none"> - Improve implementation of WSR - Reduce costs for the EU Member States - Increase access to raw materials - Ensure level playing field for European actors - Make waste shipment inspections more effective - Harmonize inspection criteria across EU 				
Method	<ul style="list-style-type: none"> - Public consultation (65 contributors: 25 industry organisations, 18 Member State authorities, 11 individuals, 5 private companies, 3 NGOs, 2 public organisations, and 1 EEA country authority). - Impact analysis of several proposed policy options 				
Outcome: Costs and benefits were analysed	Policy Options 1 – No action at EU level 2 – Specific requirements and criteria for waste shipment inspections in EU legislation 3 – Guidance for waste shipment inspections at EU level 4 – Combination of EU legislative requirements and guidance				
Indicators of progress	<ul style="list-style-type: none"> - Establishment of adequate infrastructures, capacities and enforcement systems - Reduction of illegal waste shipments - Monitoring by the Commission - On-the-spot projects - Estimates based on increased recycling rates 				
Comparison of policy options	Options	1	2	3	4
	Economic impacts	0	+++	+/-	+++
	Social impacts	0	++	-	++
	Environmental impacts	0	+++	+	++++

Table 4 Strengths and weaknesses of the methodology used for WSR’s PIA

Strengths	- Comprehensive methodology to include multiple stakeholders
Weaknesses	<ul style="list-style-type: none"> - Despite WSR being the key policy instrument related to waste export, it did not cover the transboundary movement’s impacts in the destination outside the EU. - The shipment of hazardous waste to non-OECD countries has been highlighted as the first problem on the list. Industries were the largest contributor during the consultation process but not the NGOs or INGOs working in the countries of impact.

	<ul style="list-style-type: none"> - In the impact analysis of policy option 2, environmental and social aspects are not as much prioritized as the economic costs. - Coherence was not considered as a criterion for the evaluation. - Although highlighted as an important issue focus on the impacts of waste crime is missing
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4.2.2 EC (2017 – 2020)

The WSR was amended in 2014 through Regulation (EU) No 660/2014 of 15 May 2014, mainly in order to fortify Member States' inspection systems. The WSR is currently being evaluated by the European Commission with a deadline of 31 December 2020 (DG ENV B3, 2017).

Table 5 Summary of the WSR impact assessment (2017 - 2020)

Assessed by	DG ENV B3 (started in 2017) http://ec.europa.eu/environment/waste/shipments/evaluation_of_the_wsr.htm
Key objective	"... intended to assess whether the WSR meets its objectives and is coherent with the general objectives of EU environmental policy, Circular Economy and the internal market."
Objectives	<ul style="list-style-type: none"> - Identify measures to improve the implementation of the WSR - Investigate costs and benefits associated with the implementation of the WSR for the stakeholders, at local, national and EU level
Method	<p>EEA Method:</p> <ul style="list-style-type: none"> - Will assess the criteria of: (i) effectiveness, (ii) efficiency, (iii) coherence, (iv) relevance and, (v) EU added value of the WSR <p>Retrospective:</p> <ul style="list-style-type: none"> - Standard evaluation criteria (relevance, effectiveness, efficiency, coherence and consistency and EU added value) was used <p>Evidence base:</p> <ul style="list-style-type: none"> - Evidence from monitoring - Previous evaluations and other reports - Evidence from assessing the implementation and application of legislation (complaints, infringement procedures) - Consultation (with relevant stakeholders) <p>(65 contributors: 25 industry organisations, 18 Member State authorities, 5 private companies, 11 individuals, 3 NGOs, 2 public organisations, and 1 EEA country authority).</p>

Outcome (expected):	<ol style="list-style-type: none"> 1. Effectiveness: how successful the WSR has been in achieving its objectives or progressing towards them. 2. Efficiency: costs and benefits of the EU intervention as they accrue to different stakeholders, identifying what factors are driving these costs/benefits and how these factors relate to the EU intervention 3. Relevance: the relationship between needs and problems of society and the objectives of the WSR 4. Coherence: how well the WSR has worked internally and with other relevant EU/international obligations or regulations 5. EU added value: added value of the EU-wide harmonised regime established by the WSR (together with Regulation (EC) No 1418/2007) as compared to what would be achieved by Member States at national, regional and international levels alone
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4.3 The Chinese Import Ban

China for a long time relied on the low-cost raw materials imported as waste recyclates from all over the world. However, environmental concerns were also growing with the economy. As a result, since 1996, China started slowly tightening waste imports through administrative licensing and quotas on the types and amount of waste that can be imported as well as strengthening waste restrictions at the ports. Crackdowns on environmental crimes by waste importers began across the country with the Ban to stop the inbound flow of the banned waste streams completely.

4.3.1 The impacts within China

Waste management and recycling businesses in China were affected directly by the Ban. Facing stricter control, waste companies either moved to other countries or stopped the business altogether. The Ban, however, also did have some positive impacts:

1. All the benefits of not having to deal with residual waste (human health and local environment);
2. Promotion of legally compliant waste management industries and technologies; and
3. Establishment of waste separation and recycling system.

Although there are obvious impacts within China, the impacts of the Ban, as expected, has been apparent at a much larger scale outside of China. The effects of the Ban are already visible in the major exporter countries as well as in other Asian countries that are becoming new destinations. In fact, there appears to have been a moment of reckoning for waste managers globally. It has not only exposed the technical loopholes in the ‘recycling chain’, but also affected the real cost of waste management in terms of environmental damages and shady business practices.

4.3.2 Impacts on other importing countries

The global plastic exports fell by half in 2018 compared to 2016⁴. After the Ban, much of the waste was diverted to other Asian countries including Malaysia, Vietnam, The Philippines,

⁴ <https://www.bbc.com/news/world-48444874>

Thailand, Indonesia, Cambodia, Taiwan, Sri Lanka, and India. Illegal waste handling activities have also risen in Poland and Turkey after the Ban. However, these countries are not well equipped to process and handle the sudden growth in waste imports. As a result, the waste is often being handled by small-scale scrap processors with little to no environmental regulations. More importantly, other potentially hazardous waste streams (e.g. e-waste) illegally flowing to countries like Thailand disguised as recyclable plastic waste have increased after the Ban⁵.

The waste imports in 2018 grew significantly to Malaysia making it the main destination. Malaysia reportedly became the largest importer of the diverted waste materials and the waste processing businesses in Malaysia have grown massively after the Ban⁶. This goes to both legal as well as to illegal waste handling activities and numerous waste processing facilities are being operated without permission. They tend to cherry-pick the valuable plastics out of the stream and dispose of the unwanted fractions openly with small plastic pieces eventually finding their way from there to nearby water.

Malaysian activists found waste handling sites also burning the residual plastic stream. Environmentalists started calling on the government to control the import and the Malaysian environment department is having to speak up to reject the reports of improper waste dumps⁷. The government is also taking steps to improve the situation. A Malaysian minister came out strongly against the developed nations who are sending their garbage. Malaysia has already started, and plans to continue to return contaminated plastic waste back to where it came from⁸.



Figure 8 More countries are demanding that exporting countries take back their waste⁴.

Malaysia is one case of the post-Ban situation, which represents how the situation is in the other waste importing countries.

4.3.3 Impacts on origin countries

With more than half of their waste plastic exports going there, the waste management systems in many western industrialized countries depended largely on the Chinese market.

⁵ <https://www.ft.com/content/360e2524-d71a-11e8-a854-33d6f82e62f8>

⁶ <https://www.bbc.co.uk/programmes/p07c90ff>

⁷ <https://www.channelnewsasia.com/news/asia/malaysia-no-waste-dump-perak-plastic-400-tonnes-11571590>

⁸ https://www.huffpost.com/entry/malaysia-returns-plastic-waste_n_5ced4b92e4b00e03657512ae?guccounter=1

Examples of the impacts felt by the major waste exporting countries after the Ban are presented below.

USA: Waste management companies in many US cities relied on businesses in China as the buyer of their processed materials. Since the Ban, there are fewer buyers, and recycling companies are struggling to keep their profit margin. Therefore, they pass on this cost to the cities, in some cases four times what they charged previously⁹. Some US cities are shutting down their recycling programs due to the increased cost of waste management after the Ban¹⁰. In some cases, the increased recycling cost of household waste has forced several cities to shut down their material recycling plants and to send the recyclable fractions either to landfill or incineration, which incited the fear of pollution¹¹.

Canada: In June 2019, Canada announced that it would start to ban single use plastic products by 2021. Although the motivation for taking this step may not be linked directly to the Chinese Ban, Canada has been one of the waste shipping countries at the receiving end of a confrontation from the waste importing countries. After some diplomatic exchanges between the country leaders, Canada received about 1500 tonnes of waste back from the Philippines in June 2019, which had to be incinerated¹². Malaysia and Cambodia followed suit by asking Canada to take back its exported trash.

European countries: Recycling operators in Ireland, who depended on China to buy the plastic recyclates, are facing challenges and more plastic is being mixed with paper to be fed into incinerators plants¹³. The UK, which exports 60% of recovered waste plastic, is having to deal with the lack of recycling capacity as the technical capacity of waste plastic recycling is not enough to handle the generated waste. On top of that, there are speculations that the UK might also have to take its plastic waste back from the destination countries. UK is one of the countries along with Australia, USA and Canada where the waste from Malaysia will be sent back to.

Even the ambitious recycling targets of the EU are dependent on foreign markets for the export of secondary resources. The Ban has shown how vulnerable the waste recycling industry is in the absence of quality and profitable recycling infrastructure in the EU (Munck-Kampmann et al., 2018). Waste export from the EU to China dropped by 96% in the first two months after the Ban compared to previous year¹⁴. On the other hand, German waste management companies are confident that this challenge can be converted into an opportunity for improving recycling processes to handle its waste within Europe (Veolia Deutschland, 2018).

⁹ <https://www.nytimes.com/2019/03/16/business/local-recycling-costs.html>

¹⁰ <https://www.nytimes.com/2019/03/16/business/local-recycling-costs.html>

¹¹ <https://www.theguardian.com/cities/2019/feb/21/philadelphia-covanta-incinerator-recyclables-china-ban-imports>

¹² <https://www.bbc.com/news/world-asia-48455440>

¹³ <https://www.independent.ie/irish-news/down-in-the-dumps-our-growing-waste-pile-36583882.html>

¹⁴ <https://www.independent.ie/business/world/waste-plastic-piling-up-at-ports-as-shipments-to-china-collapse-36906090.html>

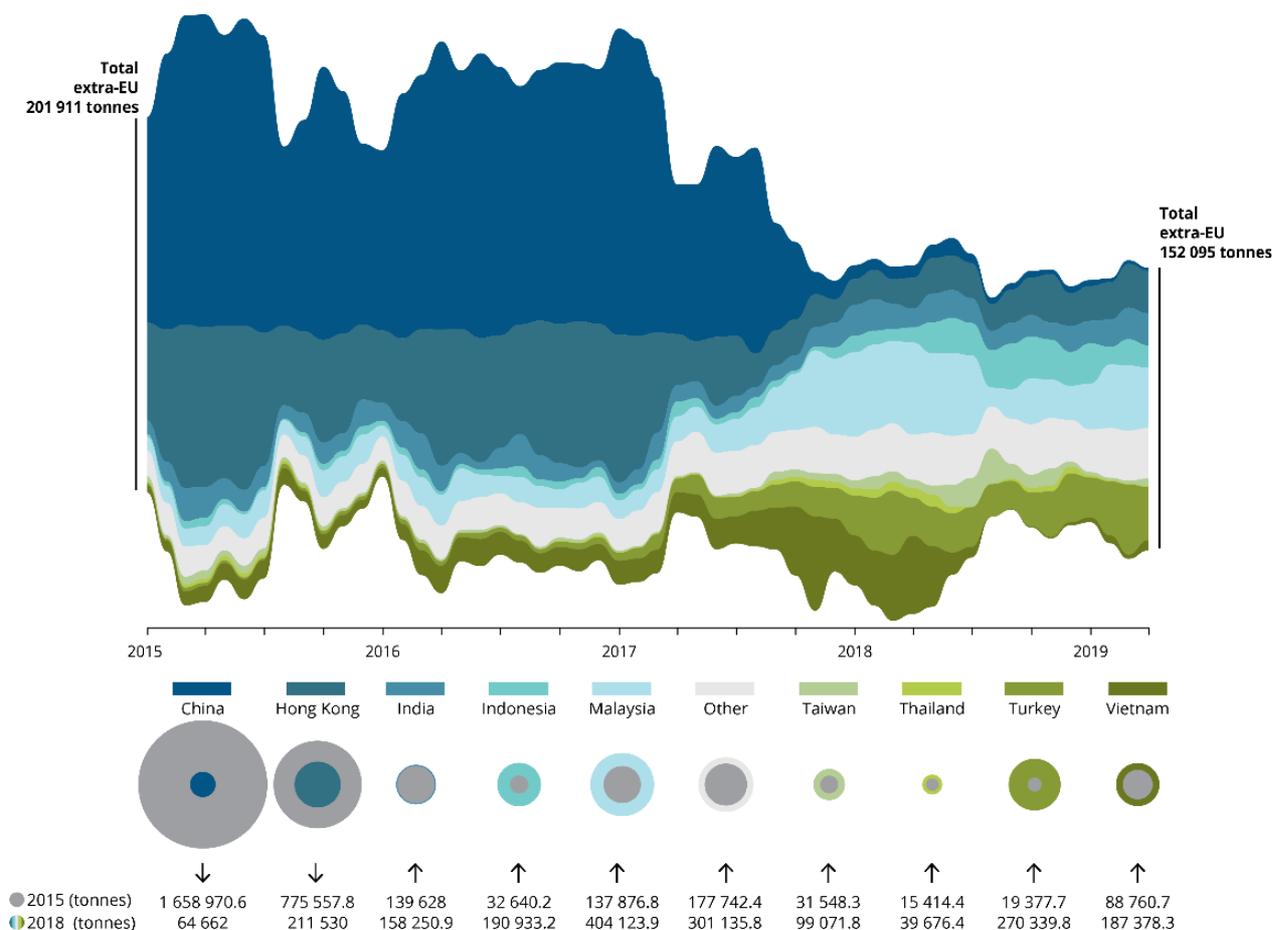


Figure 9 The trend of waste imports to China from Europe has been disrupted by the Ban¹⁵

4.4 Norwegian Amendment of the Basel Convention

In part, the Norwegian Amendment of the Basel Convention was fuelled by the Chinese import ban of plastic wastes. Since the China Ban, other Asian countries became the new destination for the plastic waste from the West, which resulted in plastics being improperly disposed of in landfills, rivers, and oceans. China, Indonesia, the Philippines, Thailand, and Vietnam are reportedly responsible for up to 60% of global plastic ‘leakage’ that ends up in the ocean. Among other objectives, the Amendment seeks to prevent and reduce marine litter and microplastics from the source countries. The Amendment proposed that only ‘clean’ plastic should be allowed to be traded without any controls but the plastic waste fractions falling under ‘other’ and ‘hazardous’ categories should require prior informed consent, as well as other labelling and reporting requirements.

Although the Amendment was welcomed by several parties, especially environmental groups, the recycling industry and other similar players have a slightly different take. The World Plastics Council (WPC) has also proposed some changes and called for more careful analysis of the proposed Amendment and a more precise definition of the terms ‘mixed

¹⁵ <https://www.eea.europa.eu/themes/waste/resource-efficiency/the-plastic-waste-trade-in>

waste’ and ‘contaminated’, in order to facilitate “environmentally sound management of waste without unduly restricting safe recycling routes”¹⁶. The WPC is a platform led by CEOs of the world’s leading plastic resin producers, including companies based in Europe, North and South America, Japan, China, Russia, the Gulf, India and Thailand.

The European Recycling Industries’ Confederation (EuRIC), an umbrella organization for the recycling industries in Europe in general has supported the Amendment but proposed some changes. Without these changes, EuRIC argues that the plastic recycling process will become more difficult for the recyclers in Europe¹⁷. Similar views are expressed by other representatives of the players in the recycling business.

The Federation of Waste Management and Environmental Services (FEAD), a representative of the private waste management industry, warns against the Amendment arguing that the changes will do more harm than good by thwarting the development of the market for plastic recycling in the EU. FEAD “.....firmly believes that this proposal is bound to miss its objective. To combat marine litter, countries need to work on preventing illegal waste dumping, improving and expanding their respective waste management and particularly collection and recycling capabilities”¹⁸.

The International Solid Waste Association (ISWA) cited the increased bureaucracy to oppose the Amendment proposal¹⁹. ISWA “.....while supportive of the objectives of the Norwegian Government’s proposal, would suggest that there are more appropriate measures and initiatives that ought to be adopted both by international organisations and national governments to secure a more sustainable handling of plastic waste.”

Table 6 Examples of reactions from some stakeholders to the Amendment

Stakeholder group	Organization	Reaction
Producers	World Plastics Council (WPC)	“To avoid unintended adverse consequences, we recommend that the proposed changes to the annexes be deferred, to allow for the creation of an expert working group to first fully analyse the practical implications and consequences of the amendments proposed by Norway.”
Waste managers/recyclers	EuRIC (European Recycling Industries’ Confederation)	EuRIC, in general, has supported the amendments with some changes proposed

¹⁶ <https://www.plasticseurope.org/en/newsroom/news/wpc-recommendation-proposals-amend-parts-basel-convention-considered-14th-conference-parties>

¹⁷ <https://www.euric-aisbl.eu/position-papers/item/280-position-paper-amendments-on-the-norwegian-proposal-to-amend-annexes-ii-viii-and-ix-of-the-basel-convention-01-04-2019>

¹⁸ <https://www.fead.be/images/FEAD-Press-Release---FEAD-Issues-Position-Paper-on-Norways-Proposal-to-the-Basel-Convention.pdf>

¹⁹ <https://www.iswa.org/home/news/news-detail/browse/1/article/iswa-position-paper-on-the-proposal-to-amend-the-basel-convention/109/>

	ISWA	“.....ISWA does not support this proposal, recommends exercising caution on amending the Basel Convention before understanding in detail the consequences hereof and encourages further deliberation on the proposal.....”
	FEAD	FEAD warns it will harm the plastic recycling industry in the EU. “The notification procedure would seriously hinder the development of an EU market for plastic recycling. It would raise the administrative burden and the costs of shipping plastic waste to EU countries where they are further prepared, or it would make shipping simply impossible.”

The Amendment will come into effect in early 2021. It is speculated that following the adoption of the Amendment the already shrinking EU plastic waste exports will drop even further. The new requirements will mean additional clearance required as prior consent²⁰. The Amendment appears to be probably a good opportunity for actors in the supply chain to reconsider use of plastic and definitely a good motivation for exporting countries to find long-term solutions. However, its implementation can be expected to be challenging – especially inspection and control at the point of departure as well as destination.

²⁰ <https://hub-4.com/news/drastic-drop-in-exports-outside-eu-and-performance-downgrade-of-recycling-in-eu-to-be-expected-from-new-trade-rules-for-plastic-waste>

5 Discussion Points

5.1 Domination of Economic aspects

Economic aspects, which define the 'efficiency' of a policy initiative, often dominate policy evaluation process with less focus on the environmental issues. The main costs in waste management include the costs related to the administrative burden as well as costs for other stakeholders for collecting and transporting, treatment and disposal costs, and additional costs for control and reporting. This seems to be a concern also brought up by researchers that more politically salient economic concerns overshadow the environmental and social issues in some approaches to assessment (Adelle and Weiland, 2012).

The assessment of European Commission (2008) estimated that in the baseline scenario, 45% (5.5 Mt) of WEEE will remain accounted and 42% (5.1 Mt) will be collected and treated properly in 2020. Even these baseline estimates seem too optimistic given the present WEEE management situation in the EU. One of the main reasons for this persisting problem is the fact that the pathways of WEEE flows are predominately determined by the material value.

Box 1 – An example from the WEEE Directive (European Commission, 2008):

The objective of the review, as stated in the document:

“The general objective of the review is to achieve the objectives of the WEEE Directive more effectively and efficiently, thus optimizing benefits for the society as a whole in return for the legislative, administrative and economic efforts required, thereby to contribute to a better regulatory environment that is simple, understandable, effective and enforceable, thus advancing sustainable development and environmental protection while helping businesses to maintain its competitiveness and ability to grow and create jobs.”

The proposed “Option (3) Minimum inspection requirements for waste shipments” does not seem to be incorporated in the Recast. It may be explained by the text under ‘Economic Impact’ of the proposed option:

“Adding minimum inspection requirements in the legal text would lead to additional inspection costs in Member States, where current enforcement activities are low. The possible additional costs will have to be taken into account when the Comitology proposals will be developed.”

5.2 Stakeholders & Ownership

The method and scope of PIA appear to be defined largely by the owner as well as the motive behind the assessment. In case of WEEE Directive, the priority of the policy impact assessment was a proper management of e-waste in the EU Member State at minimum socioeconomic and environmental cost. It also exclusively identifies, among others, the following stakeholders to be affected by the Directive:

“The EU society as a whole: for whom the impact of environmental and health damage in the EU and in third countries from EU waste is a concern” and

“Citizens and traders in third countries who either currently suffer health effects from treatment of illegal WEEE or who profit from the illegal trade”.

However, the review process does not seem to benefit from the feedback from these two groups of stakeholders. Although it may be understandably difficult and even out of the scope for the EU policy cycle, collecting inputs from the stakeholders that are affected directly or indirectly from the problem could help in finding better solutions.

As pointed out above, cost minimization is often the primary goal, which aligns with the fact that business sector is the main group of stakeholders in the process. Businesses formed the largest fraction of stakeholders in the review process. For example, out of the 65 stakeholders during the consultation process for the review of the WSR, 30 were industry organizations and private companies, whereas five were NGOs and public organizations. This shows that the businesses were proactively involved in the process.

Box 2 – A summary paragraph from Adelle and Weiland (2012) that reflects the state-of-the-art of policy assessment

“ Although there is still relatively little literature on learning arising from policy assessment (especially on the role of stakeholder evidence), and even less empirical work, academic interest in this type of research is growing relative to research on the performance of policy assessment. However, the interaction between this research and practices appears weak. This is in part because of the lack of a ready audience for this kind of work (which does not seek to inform assessment practices in the same straightforward manner as research on the performance of assessment but starts to question the very purpose of assessment). This is a point taken further in the literature on the politics of assessment, which still represents a relatively new and under-explored area of research and it is yet unclear how, or even if, research will interact with practices.”

5.3 Geographical scope of policies & Cross-border coordination

Usually, policies are national or regional (e.g. the WEEE Directive and WSR) and so are their assessments. Given that the lifecycle management of many products and corresponding wastes depends on a globalized mechanism, policies covering these activities can benefit from policies – multilateral as well as bilateral – with larger geographical scope and coherence across borders. Although it is obvious that the waste materials flow outside of the region covered by a policy, it is not evident that this fact is embraced by stakeholders across borders. This is understandable given that a regional policy is implemented in a specific region and its outside implications are of no responsibility of the regional governments. Nevertheless, in the context of waste materials, an internationally traded commodity, it should be a common concern for both countries of origin and destination, as most countries are signatory of the Basel Convention. More importantly, any waste shipment that do not follow national, regional and international regulations can be seen as illegal trade and therefore a criminal case. These are also the roots of social, economic, and environmental

issues, which originate from the mismanagement of hazardous as well as non-hazardous wastes.

For an example, illegal shipments and improper handling in countries beyond the European borders is not within the scope of the European waste legislations that aims to improve waste collection and processing in Europe. Ironically, the policy recently implemented by the Chinese government seems to have larger impact in Europe than the WEEE Directive and WSR that have been around for years. China's refusal to receive the low-grade recyclates is fuelling the discussion about waste prevention, innovation, circular economy and closed loops within the EU.

The report from Geeraerts et al. (2015) looked into the illegal shipment of e-waste from the EU to China and the effectiveness of EU legislations to counter these shipments. The report found that illegal trade of e-waste is linked not only to environmental and health impacts, but also to organized crime involving several legal actors such as businesses involved in e-waste management. Such activities are mainly driven by profit.

Another important point to consider is that the other policies did not appear all of a sudden. The Chinese import ban, for example, was in the making since 1996 when China started implementing increasingly strict pollution prevention measures. It is worth investigating how EU policies failed to internalize these scenarios. In this context, it is also important to consider the fact that there is a significant gap in environmental policies and legislative provisions at EU level and the countries EU is trading waste with. This imbalance in the strength environmental legislation means the trade is not purely based on mutual financial benefits, but on offsetting of environmental costs – a fact that arguably is the root of many of these issues.

The impacts of the Chinese Ban on the waste management situation globally is a great example of how policies can have trans-boundary impacts. EURIC and ISWA can have their positions for or against the Norwegian Amendments because it is a change that involves stakeholders from majority of the countries. This is not the case for the Chinese Ban.

Some stakeholders are reported to be blaming the Chinese Ban being against the free trade provision guaranteed under the membership of the World Trade Organization (WTO). However, there has not been any official complaint against China lodged at the WTO. It is most likely due to the fact that China can cite environmental grounds for the Ban, which is an exception in WTO's free trade rules and therefore such a complaint against China would not be justified. By involving stakeholders from other countries/regions in drafting and assessing policies can promote the practice of mutual consideration for the whole supply chain of waste management that runs across the globe.

5.4 Isolated nature of Policy Assessments

The 'coherence' with other policy interventions covering different dimensions of the same or similar issues should be evaluated by an impact assessment. This aspect of evaluation seems to have been less investigated in the reviewed assessment. Policy evaluation is usually mandated and impact assessments are carried out individually per policy but an issue such as transboundary movements of waste materials is covered by several legislative and policy interventions. To evaluate these interventions in isolation may be as per the

requirement of a policy cycle and may also be the established way to assess an individual intervention. However, in terms of tackling the issue, it may be more effective to investigate policy impacts across multiple interventions addressing the issue of transboundary waste movements.

Such an approach should not only consider various policies linked to different waste streams that are internationally traded, but also take into account the whole lifecycle of products and wastes from material extractions to final material as well as energy recovery and disposal. This kind of ‘issue-based’ policy impact assessment’ can be useful to study the coherence among several relevant policies that are already implemented as well as those planned. It can help us find more effective solutions for the issue by allowing us to expand the scope of the assessment.

For an example, the WEEE Directive has been a milestone in the management of e-waste in Europe and has facilitated collection and reporting of e-waste against the set target. However, it has not been satisfactorily successful in achieving the overall goal of reducing environmental impacts of e-waste that can come through better product design as well as through reuse and waste reduction (Cole et al., 2019). An ‘issue-based’ approach would assess the transboundary shipment of e-waste in a broader context, covering the whole lifecycle of e-products. This will require the inclusion of assessment of interventions such the EcoDesign Directive, RoHS Directive, the WSR, as well as the EU Action Plan for the Circular Economy.

5.5 Unintended Impacts

The ‘effectiveness’ should measure the effect, including intended as well as unintended changes resulting directly or indirectly from a policy intervention. The conventional policy impact assessment (and evaluation) are normally used as a part of the policy cycle in which it is planned from the beginning. It is more for evaluating how a given policy has performed, than for assessing what has happened to a given sector because of the policies implemented.

Any regulation, which uses burdensome requirements (fees and other obligations) or bans and enforcement, carries the risk of unintended and often negative consequences. So-called ‘risk indicators’ have been proposed to assist in identifying potential unintended consequences for new legislation (Morgan and Clarke, 2007). Such risks should be considered early in the policy formulation. Although it is important to anticipate possible unintended consequences of any policy intervention, failure to do so is not necessarily a reason for the consequences as regulations are often complex and it is not always possible to foresee such consequences upfront.

Box 3 – Examples of unintended impacts from the case studies used by Morgan and Clarke (2007) corresponding to the risk indicator ‘introducing fees or obligations’

Legislation	Details	Intended Impact	Unintended Impact
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<p>U.S.- Resource Conservation and Recovery Act 1976 and other legislation</p>	<p>- Requires hazardous waste to be disposed of through environmentally friendly disposal system - Introduces and permit system for operators and registration system for generators, defines hazardous waste and introduces log-book system</p>	<p>Promote recycling of potentially environmentally dangerous products</p>	<p>Dumping or open burning of waste and involvement of organized crime groups in dumping or destroying hazardous waste through their participation as transporters and operators of landfills or treatment facilities</p>
<p>Japan</p>	<p>Law introduced requiring the return to manufacturers of end-of-life electrical equipment</p>	<p>Promote recycling of potentially environmentally dangerous products</p>	<p>Increase in illegal dumping after the law was introduced</p>

5.6 Implementation of PIAs

Although the assessment of the WEEE Directive clearly identified the widespread illegal trade of e-waste to third countries, not a lot has improved since then. The documented collection rate under official e-waste collection system is still about one third. Non-compliant collection and treatment of WEEE within the EU is also a major reason for low collection rates as well as for facilitating illegal shipments. This raises the question of how useful the assessment has been in designing the WEEE Recast to be better in terms of addressing the shipment problem. Or does the problem lie on how the results of PIAs are implemented?

The implementation of findings from the review of the WSR are also not clearly visible. About 90% of stakeholders discarded the ‘No action at EU level’ during the consultation for the review of WSR. However, when we look at what changed after that, it does not look much different from what would have happened with ‘no action’. Similarly, an equal number of stakeholders were in the favour of the option to have ‘binding EU legislation’ for inspection but we did not really get such a provision because of this review.

It may not be possible to implement all the recommendation from a PIA. But in this case, the consultation process clearly suggests that the concerned stakeholders clearly favour an action on improving the inspection, which is – as identified by the review itself – the single most important measure for controlling illegal waste shipment. Nevertheless, the lack of progress in discouraging the illegal shipment raises the question on the value of policy impact assessment.

As identified by the evaluation of the WEEE Directive, the problems regarding the effectiveness resulted from factors including higher metal prices, which makes WEEE lucrative for unofficial collectors. This was reported to be one of the main reasons for lower collection rates, a problem that will only grow with time (European Commission, 2008). Further, the evaluation report states:

“The Commission services have anecdotal evidence from stakeholders of “cherry picking” by some WEEE operators the WEEE with high material value from the WEEE collected in Member States. The equipment with high value (e.g. a high precious metal content), are taken from collected WEEE to recycling plants or for illegal export.”

This statement still remains true after 11 years. This suggests that the main driver for WEEE collection and recycling is still the inherent material value. As a consequence, the illegal trade of WEEE fractions (with and without primary processing) to countries with low processing costs is still very attractive. While this problem is acknowledged in the assessment early on, its solutions are yet to be found.

Box 4 – An interesting observation from WSR PIA (European Commission, 2013)

“It is probable that waste will continue to be treated at lower costs in third countries and if so, economic incentives to circumvent the WSR and ship waste illegally, in particular to third countries, would remain. The rates of illegal waste shipments would even increase as the total waste amounts in the EU increase and more waste is diverted from disposal to recycling and recovery.”

It is interesting because the statement assumes the ‘lower cost treatment in third countries’ as a given and assumes the diversion of waste available for recycling in EU. But it does not consider the possibility – not as at least what should be the goal ideally – that the EU will require to process all waste streams within the EU and not depend on the ‘third countries’ for meeting its waste management targets. Or the possibility of being involved in cooperation with third countries to implement solutions that brings best of the two worlds.

6 Recommendations

The following recommendations are drawn based on the learnings from this work:

a. A more proactive approach (not only reactive)

The underlying causes for illegal waste shipments, as per the European Commission (2013) include differences in treatment and disposal cost between the EU and third countries, incompleteness of existing guidelines, gaps in enforcement (inspection, burden of proof) in some Member States, and organized crime in the waste sector. There is a need for a more proactive approach from European policy makers in order to foresee and act upon changes on policies at global level. This can save delays of progress on the environmental front and maybe justified in terms of financial gains. Furthermore, enforcement authorities should be involved in the process of developing policy, providing recommendations about problematic waste flows, and issuing cautions on what they think will be consequences (routes, modus operandi etc.).

b. Reconsider priorities (not only cost-benefit)

The primary goals of a policy impact assessment include making policy makers aware of socio-economic and environmental issues and involving public in the policy cycle, which improves validity of a policy. It has been a tool for serving multiple purposes such as increasing competitiveness and legitimacy or as a possible solution to the need for simplification of policy (Adelle and Weiland, 2012). However, many 'impact assessments' or 'evaluations' are used mostly for how successfully a given policy has performed. Many of these are narrowly focused on a few criteria, and especially on the cost-benefit aspects of the policy implementation.

c. A more comprehensive method (to address the identified challenges)

A more comprehensive and integrated model for Policy Impact Assessment is needed for evaluating policies linked to waste management and shipments. Such a model may be the existing European methodology for policy impact assessment with provisions to address the issues highlighted in Chapter 5. In order to do so, the model should:

- focus beyond the economic aspects of policy interventions,
- include as many concerned stakeholders as possible,
- consider relevant policies implemented across geographical borders,
- include unintended impacts along with the intended ones, and
- be realistic about the implementation of the assessment's findings.

d. Customized methodologies for policies related to waste shipments

The task, however, can be more difficult than a conventional policy impact assessment and therefore will require more effort. It will for sure be challenging to include the additional aspects to the conventional impact evaluation method. Understandably, a generalized PIA method at such a comprehensive scale may not be feasible to be implemented for all policies. Therefore, it makes sense to have customized methodology for a given topic. In the context of transboundary waste shipments, such a methodology may consider including:

- a defined timeline for the assessment and extrapolation of impacts
- detailed scenarios (quantitative and/or qualitative) under different policy options, and
- differentially weighted scores for the criteria (relevance, effectiveness, efficiency, coherence) as per the given context.

e. Collection and use of data

Lack of data is a serious concern when it comes to understanding the impacts of illegal waste shipment and management activities. A robust counterfactual assessment is often not easy (or even possible) because of the lacking data. By definition, illegal waste trades are not documented transactions. On top, we are dealing with multiple stakeholders from several countries, which makes it more challenging to collect precise data on the routes, quantities and types of waste flows. There is a need for establishing a systematic sampling approach that can be employed in order to enable data collection that will ultimately enrich the quantitative counterfactual assessment.

There are some data gathered through different means (as shown in Box 4) and the available numbers give an idea in terms of the trend of the illegal waste flows. It will be even more useful to have a more detailed overview of type and quantity of the illegal waste that is shipped through different routes and a comparison of that to the total amount of waste shipments happening through these routes. That will help identifying the hotspots of the illegal flows and thus concentrating efforts (such as inspection).

Box 5 – Data to measure progress (European Commission, 2013)	
IMPEL-tfs Seaport I (2003 – 2004):	20% illegal shipments
IMPEL-tfs Seaport I (2004 – 2006):	51% illegal shipments
"Enforcement actions" (2009-2010):	24% illegal shipments

Finally, it might be worth reflecting on the role of projects like WasteForce in the larger context of preventing illegal waste shipments. While the EU policy initiative such as WSR and WEEE Directive have been able to improve the waste collection and treatment situation in the exporting countries, it has not solved the overall problem. And the reviews of the policy impacts have identified this years ago. Nevertheless, the problem persists and there is not much documented evidence to show significant improvements in the situation of illegal waste shipments from a decade ago. This, however, is going to change with the enforcement of the recent Non-EU policies – namely the Chinese import ban and the Norwegian amendment of the Basel ban. There is an opportunity for initiatives such as the WasteForce project to facilitate systematic development of database of waste material flows across borders that can be used in future assessments of policy impacts. There is also a need for building capacity across different stakeholders to document flows and enforce legislations linked to transboundary waste shipments. As a final point, it is also important to follow-up with the aim of finding solution interventions to the identified problems as well as making sure that the regulations in place are properly implemented.

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