Evaluating Planned Adaptation within the waste management system in Germany and its applicability to the US

ABSTRACT

This essay aims at discussing the concept of Planned Adaptation with respect to the waste management system in Germany, a country whose strategic approach to waste disposal is praised internationally. The first part discusses several key pieces of German legislation, outlining the transition from a framework focusing on waste disposal, to one targeting waste prevention and minimization. The second part analyzes the various drivers which contributed to the regulatory changes on both a national and international level. The last part explores whether the German model should be adapted by the US, by looking at several differences between the two countries in terms of waste management and exploring the merits of a Planned Adaptation approach. The essay concludes that attempting to apply this model to the US is not a straightforward process, but is worth considering, given the results illustrated by objective metrics, such as the very high recycling rates and low landfilling rates reported in Germany.

Introduction

The efficiency which characterizes methods used to manage waste generation and recovery in Germany has made the country a role model on an international level for addressing and regulating this sector. Germany adopts a flexible approach to waste management, whereby policy choices align with newly emerging evidence on the properties and environmental impacts of various forms of waste. Currently, Germany is the country with the highest recycling and compost rate for municipal waste in the European Union, sending to landfills only 1% of its municipal waste (Eurostat, 2016). The waste management sector employs more than 270,000 people in 11,000 companies, generating an annual turnover totaling 70 billion euros (BMU, 2018). In order to understand the factors which enabled Germany to implement such a successful waste management strategy, an analysis of national regulatory trends is imperative. The sequence of adopted regulatory changes illustrates the concept of Planned Adaptation: rules are reviewed and adjusted as better relevant knowledge becomes available (McCray, Oye and Petersen, 2010) and incentives are established to reduce key uncertainties by means of new research. In addition, current regulation accounts for future changes, thus justifying the status of subsequent modifications as planned, and not merely a consequence of previously unsuccessful legislative approaches.

This paper aims at discussing the major regulatory enforcements which have succeeded in Germany in the last decades to address waste management. The documents mentioned here were selected due to their historical impacts on revolutionizing waste management in Germany, and are only a few among a large number of ordinances and acts which have been implemented over the years. The essay also attempts to identify the major drivers of policy change in this sector, and whether the German model is applicable to the waste system in the United States (US). Each of these aspects is targeted in a separate section of the paper. This topic is discussed as an effective example of Planned Adaptation being implemented in a national policy context, with the aim of identifying what made it successful and whether this approach can be expanded on the international scene.

Part I. Developing waste management regulation following Planned Adaptation strategies

In order to understand the context in which waste management policy has been modified in Germany, it is important to consider the institutional actors involved in designing waste management regulation. Germany is divided into 16 partly-sovereign states (Länder in German). Both the federal
government and the Länder have concurrent authority in regulating issues such as air and noise pollution, consumer protection, trade regulations and waste management. Legislation can be imposed at state level only if the federal government has not already passed corresponding laws. Legislation imposed at the federal level is approved by a Federal Council (Bundesrat) composed of 69 representatives appointed by the Länder. The enforcement of land use and environmental laws is done at a state level, and various organizations have been formed to assist with the development and implementation of environmental legislature (NREL, 1995).

Communication between the federal government and the Länder is a fundamental aspect of how waste management legislation is approved in Germany and it often involves multiple other actors, such as public and private interest groups and organizations, ministries, Bundestag (federal parliament) committees, trade organizations and industrial federations (NREL, 1995). Discussions and debates are held at multiple stages throughout the process.

Until the early 1970’s, municipalities were the ones responsible for managing waste in Germany. Although the constitution specified the legislative roles which the states were responsible for, waste management was not one of them, and the federal government was imposing legislation only where explicitly provided for (Johnson, n.d.). Around that time, the primary waste disposal method in Germany were the approximately 50,000 refuse dumps located outside all major towns, lacking regulation and control. The government decided to impose regulations when it acknowledged the risks which such sites pose to groundwater quality, with direct impacts on the drinking water provision across the country (Schnurer, 2002).


The first uniform nationwide waste disposal law was the federal Waste Disposal Act, adopted in 1972. A significantly amended form of the act was adopted in 1986 (The Waste Avoidance and Waste Management Act - AbfG) in response to legislation passed at the then existing European Economic Community (EEC) level. In the 1972 document, waste management is defined as “the recovery or production of materials/energy from waste (reuse and recycling of waste), depositing of waste as well as the necessary collection, transportation, treatment and storage”. As a direct consequence of regulating waste disposal practices, the refuse dumps were replaced by around 300 landfill sites controlled and supervised by local and regional governments (Schnurer, 2002).

The act detailed the various roles which the federal government took on in the context of waste management, such as:

• Establishing targets for reducing, recovering and reusing non-toxic wastes
• Making available guidelines as to how waste should be disposed of in an environmentally safe way
• Regulating labelling and recycling of products which might lead to toxic wastes
• Regulating procedures associated with applying waste on agricultural land (NREL, 1995).

In this first regulatory initiative, the status of reuse and recycle methods is tightly coupled to economic considerations. Under the specifications of the Act, reuse and recycling are preferred over alternative disposal methods only if it is technically feasible to do so, if the additional costs when compared to other options are not unreasonably high, and if the resulting materials or energy can be promoted on a market which already exists or can be conveniently developed (NREL, 1995). These specifications make it possible for a lot of businesses to avoid recycling/reusing as a preferred means of waste disposal over landfilling. Even though the AbfG prioritized waste avoidance as the first step in the national waste hierarchy (McCrea, 2011), the adoption of these acts did not result in the expected reduction of waste generation rates and motivated governmental efforts to impose more stringent laws (Johnson, n.d.).

A key part of the Act is Article 14, which expands on one of the previously-mentioned roles that the federal government takes on in this context: specifying objectives to be met regarding avoiding, reducing or reusing waste resulting from certain products. The consequence of this specification was the implementation of The Packaging Ordinance in 1991, a centerpiece of the German strategy in waste management. The government’s apparent intention to expand a particular set of terms of the Act into a
subsequent regulatory document can be regarded as an illustration of Planned Adaptation. In the process of adopting The Packaging Ordinance, Germany took into account the economic aspects discussed in the previous paragraph and the effect of regulation passed in 1972 and 1986, relying on this experience to propose an adjusted waste management framework. As we will see, the new framework makes it more economically convenient for manufacturers to prioritize reuse and recycling, and imposes more stringent legislative terms across the country.

The Packaging Ordinance, 1991

The adoption of this document (Verpackungsverordnung) marks Germany’s transition from voluntary agreements with the industry, to a more heavily regulated national environment with respect to waste generation. Its focus is on transport, sales and secondary packaging, thus covering products such as: materials which protect goods from damage during transport to distribution centers; containers and coverings used by consumers to transport goods or until these products are used (including disposable cutlery); additional packaging with advertising, anti-theft or self-serving purposes (NREL, 1995). Under this ordinance, manufacturers, fillers, wholesalers, distributors and retailers are obliged to recover and reuse or recycle the materials which make up all types of packaging, essentially requiring that packaging is no longer treated as municipal solid waste (NREL, 1995). The ordinance did not allow companies to credit energy generated using recovered packaging materials towards established recycling targets.

The Packaging Ordinance led to a substantial shift in responsibility regarding the management of packaging waste, the ways in which its collection and sorting are funded, and highlighted the concept of reintroducing part of the material into the economic loop by means of recycling (NREL, 1995). In order to manage the collection, sorting and transportation of packaging waste, a separate organization called Duales System Deutschland (DSD) was established. DSD operates separately from the public sector, which runs the national municipal waste disposal services. The creation of DSD addressed the need for a market for materials resulting from waste collection, mentioned in The Waste Disposal Act.

In order to benefit from services provided by DSD, companies need to pay a license fee for the disposal of packaging, which initially depended on the annual volumes of produced items. The payers are then allowed to add the Green Dot logo (Figure 1a) on their packaging, a label which indicates to consumers that the respective packaging items can be collected into separate bins (yellow bag bins). A crucial incentive for consumers to cooperate with this waste separation strategy is the absence of charges on the collection of yellow bags, in contrast with the very high fees associated with municipal waste containers (Žmak and Hartmann, 2017). The effect which the Packaging Ordinance has had on waste recovery rates in Germany is illustrated in Figure 1b, with recovery rates for certain materials increasing by as much as 60% by 1997.

Figure 1. a. The Green Dot logo, a trademark identifying products which can be collected and recycled by DSD. Source: https://en.wikipedia.org/wiki/Green_Dot_%28symbol%29. b. Evolution of recovery rates in Germany as a percentage of total waste, from 1991 to 2014. Credits to Žmak and Hartmann, 2017.
The system put in place to address the terms comprised in the Packaging Ordinance had a series of important consequences on the German economy. Firstly, it created job opportunities for employees working under DSD and acted as a financial boost for the country. Secondly, it contributed to the development of new recycling technologies particularly applicable to plastic packaging (Schnurer, 2002). Thirdly, it impacted the secondary materials market on both a national and international level. This was due to the fact that DSD collected much more than what they expected when the system was first implemented, and therefore incurred much higher collection and sorting costs. Instead of 110,000 tons of material estimated to be collected during 1992, more than 400,000 tons were in fact collected (NREL, 1995). Moreover, some administrative details were initially not properly enforced, leading to delays in fee collection from companies using the Green Dot logo. The situation escalated and reached a near-collapse stage in 1993. Some of the changes which were introduced to resolve the crisis included: deferral of payment obligations, modifications of the fee collection process to ensure timely fee payments, and the introduction of new taxation rules based on materials used in collected products. The latter point constituted an economic incentive for manufacturers to upgrade to more sustainable packaging alternatives, as it introduced a payment system in which higher fees were charged for heavier, more difficult to recycle materials (NREL, 1995)

Some of the packaging collected in excess was shipped to countries such as France at very low prices, with negative impacts on local efforts to collect and process waste. This situation highlights how policies aimed at addressing a national issue can lead to negative externalities and potential international conflicts. The Planned Adaptation concept can be applied in this context by considering how a current piece of legislation needs to be amended, in this case due to the fact that the resulting outcome did not fit projected estimates. Accounting for such eventualities is a successful strategy to implement, especially when novel frameworks or procedures with no existing precedents are proposed.

The success of the Green Dot system was extended at a European level in 1995, when the Packaging Recovery Organisation Europe (“PRO EUROPE”) was founded by DSD to avoid trade barriers across the continent (Baughan and Evale, 2004). The organisation distributed the trademark logo to countries within the European Union, whose packaging collection efforts had to align with uniform regulations, following the example adopted in Germany.

The Closed Substance Cycle and Waste Management Act, 1996

The next step in consolidating the notions which the Packaging Ordinance is based on – the polluter-pays principle, the precautionary principle, the principle of cooperation – was to expand their application to waste produced by industry and the commercial sector. According to Schnurer, three major factors led to the adoption of this act:

- The flow of generated waste did not decrease, despite charges imposed on waste volumes;
- The European Court of Justice accused Germany of not adopting the broad definition of waste established by the European Community. By embedding waste meant for recycling in the new definition, besides waste intended for disposal, Germany was required to regulate a much higher volume of waste;
- The UN Conference on Environment and Development, which took place in Rio de Janeiro in 1992, emphasized putting the concept of sustainability at the core of the production processes. The term closed substance cycle was coined by Prof. Klaus Töpfer, who was Environment Minister in Germany at the time (Schnurer, 2002).

The Closed Substance Cycle and Waste Management Act (KrW-/AbfG) was adopted in 1996 and further modified in 2010 in response to the EU Waste Framework Directive (WFD, adopted in 2008). Under its terms, the hierarchy of targets in dealing with waste is avoidance, recycling and disposal. The purpose of the Act is “to promote the closed substance cycle in waste management in order to conserve natural resources”. The appeal of such a policy framework is evident in a country which is vulnerable to potential supply shortages, due to its dependence on imports of raw materials from the world market (Bahn-Walkowiak and Wilts, 2016).
All waste generated by households and other agents was collected by national waste institutions, which were subsidized by fee payments, and preferentially disposed of within Germany (self-sufficiency principle). The Act encouraged the development of a life-cycle economy by applying the extended producer responsibility principle: manufacturers were required to increase the service life of products and to generate the minimum possible volume of waste, by employing best available techniques within industrial centers (United Nations, n.d.). The entire manufacturing process and service life were taken into consideration when estimating an end product’s impact on the environment. Conditions required from producers and owners of waste include: high-grade, i.e. resource-conserving, recycling; reasonability of additional costs incurred compared to waste disposal; existence of a market for resulting substances or energy. Waste incineration for the purpose of energy generation is now allowed only if waste has a minimum thermal value of 11,000 kJ/kg (household waste is exempt from this requirement) (Schnurer, 2002).

The Act specifies that its provisions may be further detailed in subsequent statutory ordinances adopted by the Federal Government. This specification is another illustration of Planned Adaptation, as terms which are applied to waste in general, as part of the KrW-/AbfG, are further expanded on and modified for particular types of waste in future regulatory documents. Examples of ordinances which followed the KrW-/AbfG are: the revised Ordinance on Waste Oils (2002), The Commercial Wastes Ordinance (2003) and The Waste Wood Ordinance (2003).

The influence of the 1992 UN conference on adopting the KrW-/AbfG might be considered proof of Germany considering a Planned Adaptation technique which can be referred to as After-Action Review. The conference evaluated the effects of global industrial and economic practices on the environment, highlighting the need to fundamentally change these approaches to ensure wildlife species protection and to control the global warming effect of greenhouse gases. Proposing the closed substance terminology in this context illustrates the country’s efforts to improve current practices and to aim for better future outcomes of economic growth on an international scale. Adopting this concept in Germany’s national regulatory framework demonstrates the country’s response to the UN review of the state of the environment.


Entering into force on 1st June 2012, The Waste Management Act (KrWG) replaced the 1996 KrW-/ AbfG Act, becoming the central piece of waste legislation in the country (Bahn-Walkowiak and Wilts, 2016). It replaced the three-step hierarchy in dealing with waste with a five-step process: waste prevention, preparation for reuse, recycling, other recovery (for instance, energy recovery) and disposal. The polluter-pays principle and the principle of shared public and private responsibility for waste management are also at the core of the Act, having already been invoked in earlier pieces of legislation. The KrWG transposed the requirements of the WFD related to the selective collection of paper, glass, metal and plastic, with the addition of a bio-waste stream (Cave, 2017).

Article 33 of the KrWG stipulated the creation of a Waste Prevention Programme, which was adopted in 2013 and focused on outlining waste prevention measures, both existing and potential, with applicability at national, regional and local levels. Its implementation was hastened by amendments brought to the WFD, requiring member states to plan waste prevention programs by the end of 2013. These programs should aim at decoupling the environmental impacts of waste generation from economic growth (Umweltbundesamt, 2010). In this case, both national Planned Adaptation strategies (similar to the previously-mentioned Article 14 clause announcing the upcoming Packaging Ordinance) and external international factors (EU regulation) have contributed to the adoption of the Programme.

The major objectives of the Programme are providing information and advice with the aim of increasing awareness among the general public about the need to reduce waste, alongside supporting research and development initiatives (BMU, 2018). The Programme also encourages service sharing among multiple users (for example, carpooling schemes), cutting down on food waste at every stage of the supply chains, and financial assistance of reuse and multiple use of products (O’Brien, 2018).

Despite laying out core theoretical principles which the new economic approach should be based on to minimize waste generation, neither the Act nor the Programme mentioned concrete targets to be reached in Germany, arguing that there is a lack of adequate data (O’Brien, 2018). The Programme only
refers to a “maximum reduction of waste quantities in relation to economic output” (Umweltbundesamt, 2019). This legislative phrasing might explain why, according to the German Association for Waste Management, only around 38% of waste was used as secondary raw materials in the production process in 2013, and only 14% of raw materials were obtained from waste at a national level (O’Brien, 2018).

The German Resource Efficiency Programme (ProgRess), 2012/2016
As a result, The German Resource Efficiency Programme came into force in 2012 (ProgRess I) and was revisited in 2016 (ProgRess II). The government has to submit a report to the Bundestag on the state of resource efficiency in the country every four years, followed by updating the program. This is an example of the “look-back” Planned Adaptation strategy, which is based on regular revision of previous legislation to account for reported results. It has been observed that this strategy is very rarely adopted by policymakers (Lee and McCray, pers. comm.). The fact that it is identifiable in this context adds complexity and innovation to Germany’s Planned Adaptation approach towards waste management, corroborating its multifaceted strategy.

The new policy terms are meant to promote a circular economy, taking into consideration the entire value chain, and to double resource productivity by 2020 compared to 1994 (O’Brien, 2018). Some of the approaches used to encourage resource efficiency in product development are:

- Supporting resource efficiency through standard setting;
- Continuing the Federal Ecodesign Award to incentivize the adoption of environmental performance standards in product design;
- Establishing ecodesign study modules as part of training product developers and designers;
- Assessing the adoption of legal instruments enabling longer lived products and sustainable consumption;

A number of measures are discussed as intended to reduce raw material consumption across the country, including: assisting small and medium enterprises by offering efficiency advisory services; procuring an increased number of resource efficient products and services in the public administration sector; ramping up efforts in improving consumer information; transferring knowledge and technology to developing countries and emerging economies (Bahn-Walkowiak and Wilts, 2016). In addition, ProgRess II also targets increasing the rate of organic waste collection in Germany and improving the rate of metal extraction from scrap and recycled aggregates (O’Brien, 2018).

Part II. Major drivers leading to change

The succession of policies which have been discussed above is indicative of a significant change in perspective regarding the concept of waste since the adoption of The Waste Disposal Act. The focus has shifted from regulating ways in which waste is disposed of, to highlighting methods in which certain types of waste can be recycled and (partially) fed back into the production stream, to conceptualizing a circular economy in which waste is seen as a resource, and preventing its generation has become the primary aim of regulation. The principles targeting waste prevention are included in the product design phase, with waste minimization as a priority from the onset of production. There are many factors whose interplay contributed to this sequence of changes in legislative approaches. The second part of this essay is focused on trying to untangle their contributions to the current waste management policy landscape in Germany. Understanding their interactions is important when considering Planned Adaptation, as it enables us to explain the flexibility of the German legislative system with respect to waste management. Constantly revisiting the terms of various acts and ordinances implies a lack of rigidity which is a core principle of Planned Adaptation, allowing policy measures to reconsider the way in which processing waste is perceived by the national and international communities.
It seems that this revisiting process was both a matter of planning such successive interventions, and a reaction to previous unsuccessful attempts. Examples of the former scenario are the anticipation of the Packaging Ordinance when considering Article 14 of the Waste Disposal Act, and the follow-up to the KrW-/AbfG with a succession of product-specific ordinances. The fact that the ProgRess reports were designed to be evaluated and modified accordingly every four years is another illustration of the premeditation put into practice by the German government with respect to waste management strategies. An example of the latter approach (reacting to negative consequences) is the modification of how the DSD fee collection system was regulated after the 1993 crisis.

The four major types of drivers which led to the current state of the German waste management system are: international legislation, specifically that adopted by the EU; national legislative principles established in the previously-analyzed documents; administrative approaches referring to the actual implementation of acts and ordinances; and consumer incentives.

**EU Legislation**

The EU Landfill Directive was adopted in 1999 to regulate waste management in landfills, to minimize their environmental effects and human health risks, and reduce the amount of landfilled biodegradable waste. The directive requires the amount of biodegradable municipal waste to be reduced at 35% of 1995 levels by 2016. Such efforts aimed at diverting certain types of untreated municipal waste away from landfills were already underway in Germany. In 2005 Germany implemented provisions which went beyond the EU requirements, by banning all untreated residual household and industry waste from landfills (Cave, 2017), with required pre-treatment taking place in incineration plants or mechanical-biological treatment plants (Nelles et al., 2016). Despite these regulatory efforts, however, there is no evidence that the Landfill Directive contributed to preventing waste generation in Germany (EEA, 2009).

The WFD was adopted by the EU in 2008 and reviewed in 2018. Its provisions were used to set the terms of several pieces of German legislation, particularly KrWG and ProgRess II. Articles 10 and 11 of the WFD require the separate collection of waste with a minimum provision of 4 streams – paper, metal, plastic and glass – by 2015. These requirements were transposed into German legislation as part of the KrWG. They replaced the previous 2-stream waste collection system with one in which paper, metal, plastics and glass are to be collected separately from 1st January 2015 (Article 14). The addition of a supplemental bio-waste stream (established through a Bio-waste Ordinance adopted in 2015) sets Germany apart from the other EU member countries in this regard (Cave, 2017). This is an example of German legislation going beyond EU recommendations in establishing national waste management strategies.

WFD established that waste prevention is the most favorable option in the waste hierarchy and should be adopted before reuse, recycling and recovery (Directive 2008/98/EC, Article 4). Under its terms, waste prevention had both a quantitative (limiting the amount of waste) and qualitative (related to the impacts of waste on the environment and human health) dimension, at the same time addressing the prevention of harmful substances in products (Magrini et al., 2019). The requirements specified in the directive contributed to Germany’s adoption of its national waste management plan in 2010, and of its national waste prevention program in 2013. The directive allows EU member countries to adopt their own regulatory frameworks (measures, benchmarks, targets, progress/performance assessment methods) in implementing its terms, thus providing a legal framework within which individual countries can exercise independence in establishing national provisions.

The effectiveness of putting Planned Adaptation at the core of Germany’s waste management regulatory system makes it possible for the country to respond to changes in EU legislation in a well-organized and natural manner. At the same time, it ensures that the national response as to how various EU directives are implemented consistently builds on provisions enacted in earlier acts and ordinances. The German waste management policy context is already responsive to change and inherently resilient due to embedding Planned Adaptation in its strategic approach. An external factor such as international regulation may strengthen this response, but does not make the German legislative framework in this sector completely dependent on such enforcements.
National legislative approaches

A principle which resurfaced multiple times in the previously discussed documents encompasses the producer’s responsibility in dealing with waste. It is also referred to as extended producer responsibility (EPR), as it makes manufacturers consider what happens with their products after they are sold, which is not the case for the traditional approach (Short, 2004). Germany introduced this principle for the first time via The Packaging Ordinance in 1991, and it was the first European country to do so (Cave, 2017). It continued to reinforce its implementation via the KrW-/AbfG. This approach made manufacturers reconsider product design so as to minimize the costs associated with the collection and processing of resulting waste.

Another fundamental principle in German waste legislation is the polluter pays principle. The German waste management system is entirely financed by fees from manufacturing and producing units, and it lacks governmental subsidies (Nelles et al., 2016). The fee system accounts for different types of materials used in products, as a function of their ability to be recycled, rather than the total volume of resulting waste. This approach was first introduced in German legislation when The Packaging Ordinance came into effect in 1991 and it has been present in the national context ever since.

Administrative approaches

The separate collection scheme used by Germany has several characteristics which make it a particularly successful one. The system is consistent throughout the country, involving the usage of bins with different colors for waste separation, with the same type of bins being used in households and businesses alike. Other factors contributing to the success of the initiative include: enforcing supervision at the point of collection, by means of fines for non-compliance and stickers identifying wrong materials; a bin labelling system based on bar codes read at the point of pick-up, for which cost is differentiated based on waste material (very low cost per weight for food waste and recycling, very high for remaining garbage); the use of bio-digesters for food waste (Cave, 2017).

Consumer and producer/manufacturer incentives

In 2003, a national deposit-return scheme for refillable drinking packaging was introduced. Customers pay 25 cents for refillable plastic packaging for beverages purchased in stores, and are reimbursed when returning the empty containers. According to Zero Waste Europe, the result of this strategy was a 98.5% return rate of refillable bottles (Cave, 2017). Since 2005, every shop with an area of more than 200 m² needs to have a collecting facility in place for customers to return the plastic containers (Žmak and Hartmann, 2017).

Besides this financial incentive, another such initiative was implemented when The Packaging Ordinance was promulgated. As previously discussed, it refers to fee waivers on the collection of yellow bags destined for the DSD packaging return scheme and relatively high fees charged per household for the collection of municipal waste bags.

The succession of the legislative documents discussed above highlights the encouragement of a behavioral change among the German population, namely putting waste prevention and resource minimization above ways of dealing with waste once it has been produced. Strategies such as the introduction of ecodesign study modules and more comprehensive customer information campaigns mentioned in the ProgRess reports are targeted at educating customers, with the aim of changing their approach towards waste generation. Such methods should be strongly encouraged in the country which, according to Umweltbundesamt (The Federal Environmental Agency), had the highest per capita packaging consumption in the EU in 2016, with more than 220 kg per individual. The fact that such high figures are recorded after the legislative efforts of 2012 and 2013 (the KrWG and the Waste Prevention Programme) highlights how difficult it is to shift behavioral patterns towards a more minimalistic and efficient lifestyle. Umweltbundesamt has attributed the high levels of packaging consumption to a continued trend for preferring smaller over large size packaging, having products delivered via mail instead of shopping locally, and opting for takeaway food. It is expected that efforts at promoting waste prevention will continue to be a central part of future German legislation in this sector.
Planned Adaptation is also materialized in these behavioral approaches, as it enables shifts in social perspectives towards tackling waste in national regulation. In the last decades, there has been a continuous change in how citizens worldwide reconsider product acquisition, as more research has shed light on the negative effects that a consumption-intensive society has on the environment. As a result, behavioral practices have started to change, from avoiding purchasing food wrapped in single-use plastics, to limiting meat consumption in an attempt to protect global resources such as forest cover. The efficiency of the waste management strategy of Germany is partly due to taking into consideration such sociological implications when designing its policy.

Part III. Could Germany be used as a model for the US regarding waste management?

Germany is considered the country with the strongest packaging legislation in the world and has long been regarded as an international role model for solid waste management (NREL, 1995). At a multinational level, The Packaging Ordinance stimulated the promulgation of the European Packaging Directive in 1994 (Viehöver, 2000), which stipulated that all member states must establish a system for the collection and recovery or recycling of used packaging. As is the case with WFD, the Packaging Directive allowed individual countries to be flexible as to how these terms would be integrated into national regulations (Short, 2004). Complementing the impacts of European legislation, the establishment of PRO EUROPE proved a successful initiative across the European Union, with ten more members implementing the green dot system by 2001, and a current list of 31 members, both within and outside of the Union.

Considering the German model on a national level, France passed in 1992 Decree No. 92-377 regulating packaging waste, whose Article 4 stipulated that any entity which is responsible for marketing a product must contribute to, or provide for, the disposal of all associated packaging waste (Short, 2004). The equivalent of DSD in France is a firm called Eco-Emballages S.A., which organizes the national collection and recovery system. The major difference between the two firms is the fact that Eco-Emballages does not collect the waste itself, but instead partners with local authorities responsible for collecting packaging, which in turn receive support from the firm. The producers pay for the collection of packaging associated with their products based on a flat-rate amount and an additional charge which depends on weight and material used (Short, 2004). The resulting outcome of this partnership was a jump from a 13% glass recycling rate in 1992 (the only material collected since 1974) to a 67% recycling rate in 2012, applied to all types of packaging.

According to Short (2004), a key factor determining the success of the German and French initiatives is the privatization of duties – such as defining what is recyclable packaging and setting charges for producers to be included in the program. The author refers to privatization as an important lesson offered by the German model and one which should be adopted in future attempts at establishing similar initiatives. Another equally important factor is the fact that these initiatives are mandatory (McCrea, 2011). As has been discussed above, before the implementation of The Packaging Ordinance, agreements with industry were voluntary in nature, and no significant trend in waste reduction has been observed. The promulgation of stricter regulation has paved the way towards today’s well-established and stable waste management system in Germany.

Compared to the US, Germany has been faced with waste-related issues for a longer time, due to a more limited availability of territory for establishing new landfill sites, a higher population density, a longer history of putting into practice alternative waste treatment and disposal methods (NREL, 1995) and a limited supply of natural resources. In contrast, the US comprises large regions which lack extensive industry and are not densely populated, and benefits from vast natural resources which result in lower material costs (Short, 2004; Reynolds, 1995). Establishing a national waste collection system copied after the German one could prove unpractical, given the distances between waste processing facilities and population centers (Short, 2004).

Acknowledging these considerations, the last part of this essay aims at evaluating the extent to which Germany’s regulatory framework regarding waste management could be applied within the US. To
put things into perspective, Figure 2 shows the evolution of municipal solid waste recycling and composting rates in the US in 2017, and the breakdown of waste disposal methods across the country. The corresponding statistics for Germany are a 1% landfilling rate in 2016, 67% recycled household waste and 70% recycled commercial and production waste (BMU, 2018).

Figure 2. a. Municipal solid waste recycling and composting rates between 1960 and 2017 in US. b. management of municipal solid waste in the US in 2017. Adapted from EPA, 2019.

Despite its division into Länder, Germany has shown a remarkable consistency in implementing waste management policies at a national level. This is partly due to the continuous dialogue between various stakeholders involved in the decision-making processes at multiple stages, before adopting a new piece of legislation. The justification behind this approach is the attempt to address differences of opinion among stakeholders during the developmental and passage phases of regulations, rather than by means of court action subsequent to their promulgation (NREL, 1995). Such an approach is referred to as a “top-down” strategy driven by rationally derived principles, which are then implemented in various legislative initiatives (Johnson, n.d.). Examples of such principles are the ones mentioned above, referring to the producer’s responsibility, the self-sufficiency and the polluter pays principle. This “top-down” strategy has been implemented throughout the EU via documents such as the WFD, the European Packaging Directive and the Landfill Directive, as they set out the major objectives of adopted regulation, but do not specify uniform, quantitative targets for the member states. It is each member state’s responsibility to translate these broad principles into regulation depending on the legislative landscape specific to each nation. A similar strategy could be implemented in the US, where uniform national goals could be accompanied by a flexible range of targets which would suit the profiles of individual states.

In contrast, the policy framework in the US can be described as a “bottom-up” approach based on a case-by-case consideration of facts, typical for a decentralized management system which favors the optimization of existing conditions over the implementation of innovative strategies (Johnson, n.d.). Compared to Germany, the precautionary principle is not firmly rooted, and even though the polluter pays principle is accepted, the costs that the industry incurs as a consequence of environmental regulations weighs heavily in discussions (Schreurs, 2003). The first federal attempt at establishing waste-related policy was The Solid Waste Disposal Act of 1965, which stipulated technical and financial assistance for state and local governments to support waste disposal initiatives. However, it did not specify any nation-wide action towards centralizing waste planning, allowing each state to decide on individual policies (Johnson, n.d.). Subsequent policies continued to be based on the same approach, and as a result, a federal authority on waste management never fully developed in the US. This led to litigations on the subject being resolved through the Supreme Court (Johnson, n.d.; McCrea, 2011), a tendency that makes the US context a more confrontational one, which is also reflected in the decision-making processes (Schreurs, 2003). There are no regulations regarding take-back of waste by manufacturers following products utilization, partly due to
the lack of authority of the US Environmental Protection Agency (EPA) (Short, 2004). Even though the Resource Conservation and Recovery Act (RCRA) of 1976 gives EPA the authority to establish minimum federal standards for the disposal of non-hazardous solid waste, each state is responsible for developing plans to enforce the standards (McCrea, 2011).

The need for changing consumers’ and producers’ viewpoint on the traditional, linear model of product manufacturing – also called cradle-to-grave approach, in which resources are consumed for product creation, sold and then disposed of – has also been acknowledged in the US (McCrea, 2011). The barrier to employing a circular approach – the one promoted by ProgRes I and II in Germany – is economic in nature: it is more profitable in the short term to simply dispose of the resulting waste, rather than employ long-term methods such as reuse or recycling (Ackerman, 1997). This could explain why, despite EPA’s recommended waste hierarchy which places waste avoidance at the top and landfilling at the bottom, regulation in the US is highly focused on disposal (the Clean Air Act applies to emissions from landfills and incinerators) and clean-up (the Comprehensive Environmental Response, Compensation and Liability Act – CERCLA – makes polluters accountable for the clean-up costs associated with historically contaminated disposal sites) (Thomson, 2009). It has, in fact, been argued that CERCLA can be considered a precedent for federal legislation aimed at making manufacturers liable for product packaging, at the same time not infringing upon their individual liberties (McCrea, 2011).

Even though the US has been a pioneer of environmental policy in the 1970s, with a powerful environmental NGO community developing around the same time, the country did not maintain its position as a leader in implementation. Contributing to this historic reality are both its federal structure and the increased use of litigation as a way of opposing regulation (Schreurs, 2003). In the 1980s, the industry intensified its anti-regulatory endeavors, arguing that many environmental legislations impeded the success of economic activities. The effort culminated in the attempt of the Reagan administration to weaken EPA’s authority and undo many regulations. The most straightforward way in which environmental policy can change in the US is when activists partner with industry representatives in support of a particular legislative action (Schreurs, 2003). Under these circumstances, it is increasingly difficult to prevent bias from entering the policy agenda, potentially leading to the adoption of measures which do not address environmental issues in an efficient way. It is highly unlikely that the industry will ever become voluntarily supportive of such legislation. This explains the need for Germany to make its waste collection and recycling approach mandatory and uniformly adopt the EPR principle.

Despite the lack of a uniform EPR strategy across the US, initiatives to collect and process waste have been implemented in a number of states. Maine was the first state to adopt EPR regarding the take-back of electronic waste in 2004, making manufacturers responsible for its recycling or safe disposal. Its labelling system was similar to the Green Dot, and the initiative has been extended to 23 states and New York City by 2011 (McCrea, 2011). But EPR in the US has so far been adopted on a product-by-product basis, a situation which does not solve the issue of hundreds of other types of waste produced in the US. The much needed “framework approach”, applicable to multiple products concomitantly, has not, as of 2013, been implemented in any state (Nash and Bosso, 2013).

There are certain advantages associated with developing waste management legislation at the state, rather than the federal level. States’ powers are not limited to constitutional rights, as is the case for Congress, and states’ inherent authority to protect the health, safety and welfare of their citizens is translated into a larger potential engagement in environmental policy design; moreover, state-federal partnerships are another possible plan of action (Campbell-Mohn, Breen and Futrell, 1993). As Justice Brandeis proposed, individual states could act as laboratories when it comes to policy matters, applying various approaches and thus enabling inter-state comparisons of the benefits and challenges of each. Such natural experiments could ultimately inform the policy-making process at the federal level. The same perspective has been embraced when suggesting that implementing an EPR approach in the US would be much more successful on a state-by-state basis, to account for local consumption habits (McCrea, 2011). This strategy does not come without its challenges: manufacturers might have a difficult time in trying to comply with a patchwork of multiple state laws rather than a single, uniform provision of terms (Short, 2004). On the other hand, the size of the US makes it difficult for a uniform, federally-managed system to operate across its territory. However, it is
worth keeping in mind that an entity created after the French model is based on a partnership with state institutions, which might be a suitable course of action in the US.

Trying to explain the differences between Germany and the US with respect to another environmental issue (namely, the fact that the industrial discharges into the Great Lakes were more toxic than those of German factories into the Rhine, despite more stringent American regulation), Marco Verweij proposes several contributing factors, also applicable to the waste management context. He argues that the concept of American exceptionalism promotes liberty and individualism as major ideological concepts, whereas European values emphasize hierarchy, authority and deference (Verweij, 2000). Such discrepancy may be translated into a weaker tendency to abide by legislation in the US, where the industry is more prone to refuse environmental standards.

Another difference between the two countries is that non-governmental actors have fewer chances to get involved in such policy making in Germany, whereas their right to sue various companies or state agencies when failing to enforce environmental legislation in the US is not “conducive for a coming together of the minds” (Verweij, 2000). NGOs and environmental research institutes compete with industrial agents to have their interests represented on Capitol Hill, whereas the rise of similar groups in Germany was followed by the creation of a Green Party; once elected to parliament, the Green Party played an important role in facilitating discussions between various stakeholders with respect to environmental regulation (Schreurs, 2003).

Moreover, the fact that the US is a presidential system, while Germany is a parliamentary one, comes with another set of discrepancies. The American presidential system is prone to lobbying of Congressional committees by various interest groups which therefore influence policy matters. Furthermore, legislators have less responsibility for implementing the laws they propose, sometimes resulting in the adoption of unrealistic laws. Germany’s parliamentary system, on the other hand, enables a more coherent approach towards law promulgation, due to the close collaboration between different ministries while creating legislation (Verweij, 2000). These observations are confirmed by the previously-mentioned German perspective towards waste regulation, centered on dialogue between multiple stakeholders at various stages in the process.

Yet another difference between Germany and the US is the adoption of corporatism over pluralism. Germany, as many other European countries, adopted corporatism as a system in which negotiations between organizations are supervised by the government and aim at reaching a consensus acceptable to all parties. Under pluralism, however, “individual actors fend for themselves” (Verweij, 2000), lacking the motivation to come together and contribute constructively to the creation of environmental regulation.

To put these arguments into perspective, we can compare the US and the EU approaches related to the movement of waste between states. The US Supreme Court has maintained the view that limiting interstate waste movement would infringe upon the idea of trade in general, since waste is considered a form of goods. In contrast, the European Court of Justice has prioritized principles such as self-sufficiency and proximity of waste disposal sites to the sources of waste, in an attempt to account for the environmental impacts associated with waste transportation (Johnson, n.d.). The latter line of action is also meant to avoid interstate conflicts, such as the one which resulted from the export of significant quantities of collected packaging in Germany in 1992 (see the Part I discussion on The Packaging Ordinance).

This illustrative example supports the statement which McCray, Oye and Petersen (2010) make with respect to the adoption of Planned Adaptation strategies in the American legislature: “the demand for self-corrective mechanisms in American regulation is persistent as a general nonpartisan good government principle, but is as yet unpopular in application”. The authors affirm that it is American agencies, rather than governmental administrations, which do not support the concretization of this strategy on a national level. Some of the possible reasons include: the fact that agencies are not eager to install self-correction measures, even when applied to isolated policy contexts; their need to enforce rules which have to be credible, and whose effectiveness therefore diminishes if these rules are softened or removed altogether at a later stage; the consideration that an agency’s public reputation could be threatened if rules are changed often (McCray, Oye and Petersen, 2010).
However, the German regulatory approach which was analyzed in this essay serves as an example of a successful application of the Planned Adaptation strategy into a national legislative framework. At an institutional level, there is a certain degree of similarity between Germany and the US, in that both countries are divided into semi-independent legislative bodies (Länder and states, respectively) with some autonomy in law implementation. It might therefore be possible for the US to draw inspiration from Germany’s methods of establishing a dialogue between different agents involved in law promulgation and build a more centralized decision-making body.

Considering Planned Adaptation a fundamental principle as part of law enforcement is particularly efficient in areas where new knowledge is constantly emerging. Environmental regulation is such a domain, with new studies constantly reassessing the effects of anthropogenic actions on the natural world and recommending more stringent standards for pollution levels, waste disposal methods, manufacturing processes etc. In Germany, government policy is increasingly guided by the precautionary principle, favoring the adoption of environmental protection measures when scientific uncertainty is significant (Schreuras, 2003). Embedding such updated knowledge into law does not weaken a particular agency, on the contrary, it offers a country a certain level of resiliency which becomes an advantage in the face of rapid changes, such as the ones posed by the ongoing climate crisis. It also characterizes a mature society which has the ability to readdress prior consensus scenarios and reach new agreements in a timely and efficient manner. The key concept embraced by those who place Planned Adaptation at the core of their legislative efforts is that policymaking in these fields is open-ended. The documents discussed here represent a series of sequential adjustments in which conclusions specified in previous acts feed into the new ones, thus establishing continuity while allowing for a flexible approach. The credibility of Germany’s regulatory bodies is by no means diminished by applying such methods. Quite the opposite, Germany’s waste management policy framework is appreciated on an international level.

A prior analysis of examples from the US indicated that in all cases where Planned Adaptation was observed, this approach “has been imposed from outside the executive agencies themselves” (McCray, Oye and Petersen, 2010). This is certainly not the case in the Germany waste management context, as Part II of this essay indicates. Even though EU legislation has played an important role in revisiting the terms of some of these documents, in some cases Germany went beyond what was stipulated at the union level, and supplemented EU’s recommendations with national incentive schemes. According to the terms of ProgRess II, Germany also actively shared its knowledge on waste disposal matters with countries in which such technology is currently under development. The unexpected success of The Packaging Ordinance in such a short time following implementation indicates that the population is on board with governmental initiatives, actively supporting efforts targeted at better waste management. People’s predisposition to being a factor in augmenting environmental problems should be kept in mind when attempting to change the US system: Vandenbergh (2001) affirms that many US citizens fail to acknowledge their contribution to such issues and resist attempts to change individual behavior. Therefore, both internal and external factors lead to the successful implementation of Planned Adaptation in the national legislative context and should be considered if this model is to be extended to the US.

If attempted in the US, the German approach should initially be adapted to the new context, due to the complexity of factors influencing the outcome of a particular piece of legislation in a specific national setting. The discussion about whether to implement adaptive policies at the state rather than federal level is important to keep in mind in this context. Variations of certain parts of the German waste management system should be carefully considered. Understanding the role of demographics, legal systems, culture, economy, history, geology and resource provisions, among other factors, in shaping the impact of such national legislation is imperative when considering applying it to a new country (NREL, 1995). Taking into account all these variables might prove a lengthy and convoluted process. Nevertheless, we believe that it is worth considering this regulatory shift when aiming for a better waste disposal system. Germany’s extended Planned Adaptation strategy regarding waste management offers constructive lessons from the past, as well as examples of effective measures to overcome policy challenges and promote a responsible, sustainable manufacturing approach. It is certain that future regulatory courses of action will continue to adapt to emerging knowledge and the ever-changing status of technology in the field. As the legislative
documents analyzed here prove, multiple techniques should be employed when applying Planned Adaptation to policy decisions. They ensure a thorough understanding of the complexities associated with Planned Adaptation and flexibility in the face of eventual externalities which might occur alongside system implementation.

Conclusion

This analysis concludes that placing Planned Adaptation at the core of the German waste management system has succeeded in creating a resilient legislative framework, able to tackle waste disposal issues in a very efficient way and serving as an international model for similar initiatives. Multiple Planned Adaptation techniques can be identified when analyzing the adoption of various legislative documents, highlighting the complexity of this approach in German waste management regulations. It is expected that terms set in documents which are currently legally active will be updated in future acts and ordinances, in accordance with a process which has been operating since the beginning of waste regulation in Germany. The success of this method is due to both international factors, such as EU legislation, and national ones, such as a consistent administrative approach towards bin labelling, efforts aimed at educating the population to secure their support, and promoting a sound set of principles throughout promulgated acts.

There are numerous differences between the process adopted by Germany and the one active in the US regarding waste disposal. However, we believe that an attempt at applying Germany’s strategy to the US is enabled by a certain degree of similarity between the two countries’ institutional settings, and should be pursued in the future.

References


