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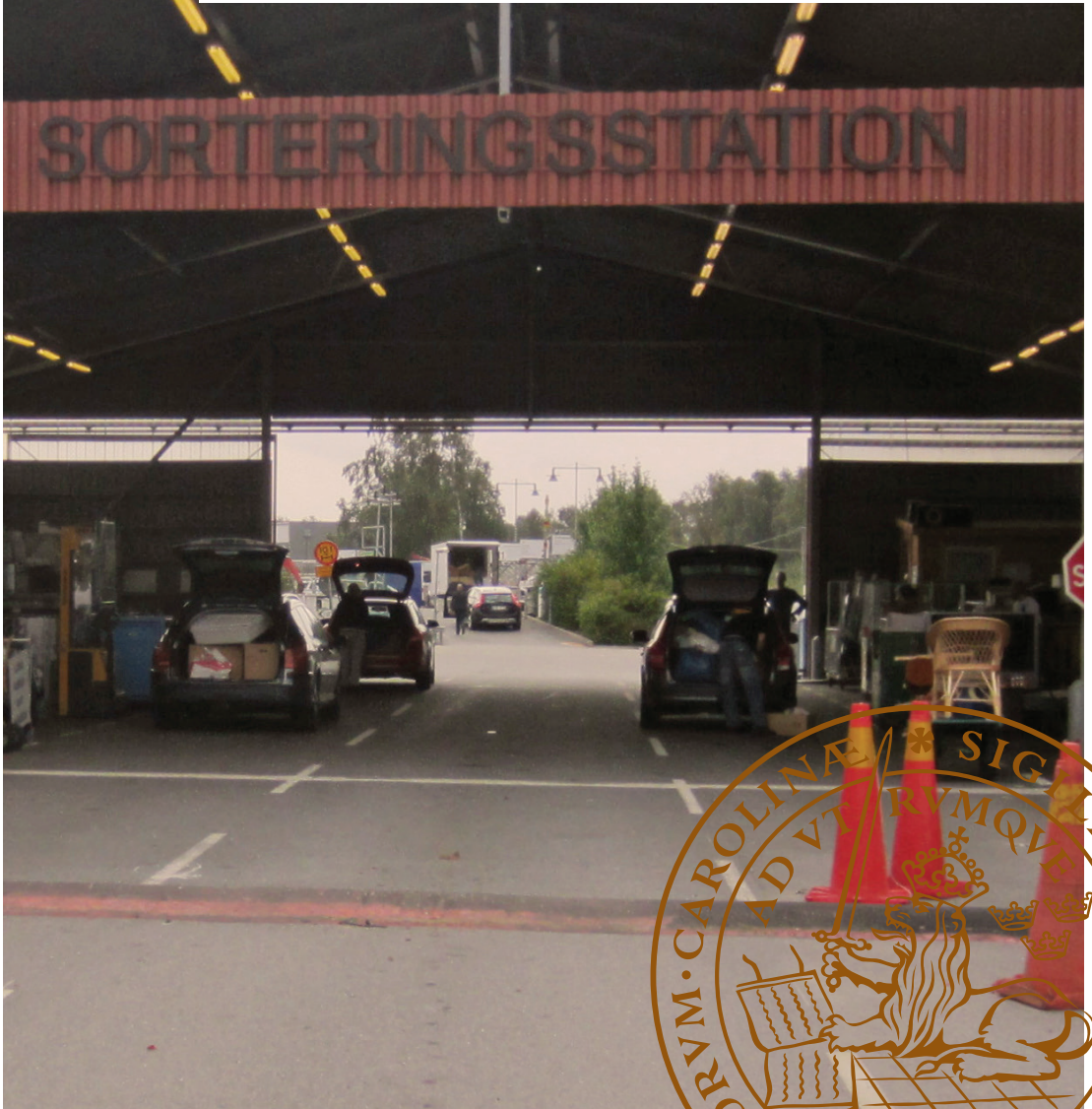


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Waste prevention in Sweden 2008-2015 - An analysis of key waste prevention initiatives

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Waste prevention in Sweden 2008-2015

- An analysis of key waste prevention initiatives

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Abstract

The increasing importance being placed on waste prevention in Swedish waste governance raises the question of how waste prevention is defined in practice. This paper presents a qualitative analysis of a sample of fifty-one key Swedish waste prevention initiatives with the purpose of identifying which kind of actions are imagined, promoted, and set into motion under the label of waste prevention. The analysis shows that despite their apparent variety, the initiatives in the sample boil down to three main types of actions: raising awareness about the need to prevent waste, increasing material efficiency, and developing sustainable consumption. In contradistinction to the formal definition of waste prevention in the European Waste Framework Directive (2008/98/EC), what emerges from analyzing the initiatives in the sample is a definition of waste prevention as something heterogeneous, contradictory, and evolving. Such a definition of waste prevention in practice provides an understanding of the entrepreneurial and organizational dynamics of waste prevention.

KEY WORDS

Waste prevention, Waste governance, Waste communication, Material efficiency, Sustainable consumption

NOTE

For an expanded version of this report, see: Corvellec, H., (In Press) A performative definition of waste prevention. *Waste Management*. <http://dx.doi.org/10.1016/j.wasman.2016.03.051>

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1. Introduction

Waste prevention has become a component in its own right for a transition toward European sustainable waste governance (Bortoletto, 2015). The European Waste Framework Directive (The European Parliament and the Council of the European Union, 2008/98/EC), which orients waste policy in the European Union (EU) and urges its member states to move beyond landfills, posits that prevention is the best possible way to deal with waste. Following the Directive's requirement, a majority of member states have recently established waste prevention programs that aim at breaking the link between economic growth and the environmental impacts associated with the generation of waste (Eionet, 2015). The Swedish plan has been elaborated by Naturvårdsverket (2015 [2013]), the Swedish environmental protection agency.

On paper, the definition of waste prevention is clear. For the OECD (Vancini, 2000), waste prevention occurs before products or materials are identified or recognized as waste: it consists of actions that reduce both the quantity and the hazardous character of waste, and encompasses strict avoidance of waste, reduction at the source, or product reuse, but not recycling that belongs to waste minimization. Similarly, the European Waste Framework Directive defines waste prevention as “measures taken before a substance, material or product has become waste, that reduce: (a) the quantity of waste, including through the re-use of products or the extension of the life span of products; (b) the adverse impacts of the generated waste on the environment and human health; or (c) the content of harmful substances in materials and products.”

Out in the field, however, waste prevention refers to a broad range of activities. Countless local governments, corporations, non-profit organizations, professional bodies, cooperatives, and individuals have embarked on initiatives that claim to prevent waste. The European Week for Waste Reduction alone has identified nearly 12,000 of these initiatives in 2014 (European Week for Waste Reduction, 2015). Waste prevention can occur in

all stages of design, extraction, production, distribution, consumption, and waste management; it refers to regulatory, economic, communicative, and technical instruments; it can pertain, as in the European Waste Framework Directive, to the volume of waste as well as its dangerousness; it refers to measures that are as opposed as not using and re-using; and whereas waste prevention usually does not include recycling, recycling leads to a combined reduction of waste brought to landfill and raw materials extraction (Arcadis Belgium, 2010). Moreover, householders routinely equate waste prevention with recycling (Tucker and Douglas, 2007), and in everyday parlance waste prevention, reduction, or minimization are often used as synonyms. In addition, classification of what constitutes prevention differs from country to country; for example, composting is considered as prevention in France (Ministère de l'Écologie du Développement durable et de l'Énergie, 2014) but not in Sweden (Naturvårdsverket, 2015 [2013]). In actuality, there are a plenty of definitions of waste prevention around.

The present report presents an analysis of fifty-one Swedish waste prevention initiatives that have been shortlisted for waste prevention competitions or best cases collections between 2008 and 2015. The purpose of analyzing these key initiatives is to chart waste prevention in Sweden today to develop an understanding of the organizational rationale of waste prevention (Corvellec and Czarniawska, 2015; Pongrácz, 2009). This understanding is to complement the current understanding of producers' (Deutz et al., 2010; Gottberg et al., 2010; Wilson et al., 2012) and consumers' attitudes toward waste prevention (Abeliotis et al., 2014; Bortoleto et al., 2012; Cox et al., 2010; Quested et al., 2013) so as to point to barriers and facilitators of waste prevention (Bartl, 2014; Fell et al., 2010). It is also to provide a theoretical understanding of the variety of local efforts (Cole et al., 2014; Kurisu and Bortoleto, 2011, 2012; Murphy and Pincetl, 2013; Young et al., 2010) being made to move up the waste hierarchy (Gregson et al., 2013), of the mundane character of waste governance (Woolgar and Neyland, 2013), and of a transition toward a more sustainable management of waste.

The report's main finding is that waste prevention initiatives promote three types of action: raising awareness that waste needs to be prevented, increasing material efficiency, and developing sustainable consumption. Being heterogeneous, contradictory, and evolving, this definition of waste prevention provides an understanding of the entrepreneurial and organizational dynamics of waste preventing practices.

2. Method:

Data collection and analysis

2.1 CONSTITUTION OF THE SAMPLE

The study is based on a sample of Swedish initiatives that have been singled out in best case collections or to participate in waste prevention competitions (See Table 1; see also Appendix 1 for a presentation of the studied initiatives). Nineteen initiatives have been shortlisted by Avfall Sverige, the Swedish Waste Management and Recycling Association to participate in the European Week for Waste Reduction award competition between 2009 and 2014, some of them having become a prize winner (European Week for Waste Reduction, 2015). Three initiatives were shortlisted by the Swedish trade magazine Recycling och miljöteknik to participate in the first edition of the Waste-preventer-of-the-year award in 2014 (Mentor Communications AB, 2014). Four initiatives have been retained to represent Swedish waste prevention in the European research project Pre waste on waste prevention (Pre Waste, n.d.). Twelve initiatives come from a collection of best practices issued by Avfall Sverige (2011), and another sixteen initiatives come from a similar collection made in 2015 (Avfall Sverige, 2015a). One initiative has won the 2014 competition for re-use for public-housing (Sveriges Allännyttiga Bostadsföretag (SABO), 2014). Finally, three initiatives have been “Miljönär” of the month (a play on words where the Swedish term Miljö which means environment replaces the term million in the Swedish word for millionaire) in a yearlong campaign organized by Avfall Sverige (2015b). Five initiatives appear twice and one three times, and some organizations appear more than one time but with different projects. The rationale of the sample is to put together initiatives that in the last 10 years or so have been recognized in Sweden as good examples of waste prevention. Data about these initiatives come exclusively from publicly available information, such as the initiatives’ Websites (see Appendix 1) or best case collections (Avfall Sverige, 2011, 2015a).

Table 1: Composition of the sample by origin of the initiatives

Origin of the retained initiatives	Total	Number of non-identical initiatives
Shortlisted for the European Week for Waste Reduction award	19	18
Waste-preventer-of-the-year award, trade magazine Recycling	3	3
European Research project Pre Waste	4	3
2011 best practices report, <i>Avfall Sverige</i>	12	9
2015 best practices report, <i>Avfall Sverige</i>	16	15
2014 Public housing re-use competition	1	1
2015 Campaign <i>Miljönär</i>	3	2
Total	58	51

One could find the sample biased as it gives a predominant role to *Avfall Sverige* that nominates Swedish cases to the European Week for Waste Reduction award competition or has published two best practices collections. But such a bias is part of the methodology retained. Through its publications, courses, conferences, media presence, and lobbying, *Avfall Sverige* is pivotal to the Swedish discourse on waste prevention. Therefore, the initiatives that it singles out tend to gain a high visibility and become tone-setting for how waste prevention is understood by waste governance authorities and other stakeholders.

2.2 DATA ANALYSIS PROCEDURE

Even if based on a quantitative description of the sample, the analysis is qualitative. Following the general framework developed by the Pre Waste project (Pre Waste, 2012), a difference is made between the waste prevention initiatives themselves, what Pre Waste calls the “waste prevention action,” and the actions that this initiative intends to induce, their effects or what Pre Waste calls the “waste prevention habits.” The analysis also takes close notice of the four-dimensional typology of waste prevention action developed by Arcadis Belgium (2010) according to material flow, policy cycle, nature of the instrument, and prevention effect. It builds as well on the fine-tuning

in four levels of the highest step of the European waste hierarchy proposed by Fredriksson (2015), from bottom to top: re-use, reduce wastage, adopt material efficient and sustainable products, and avoid consumption.

Approaching organizing as the connecting of actions (Czarniawska, 2004), the analysis focuses on the type of actions that are undertaken and how these actions are connected, both for the waste prevention initiatives themselves and for the waste preventing actions that initiative takers want to induce. The key analytical question is “What is being done, and how is this connected to other things that are being done in the same context” (Czarniawska, 2004:784). The gerundive form “-ing” stresses that the aim is to unfold the waste preventing processes that initiative takers want to set into motion.

The first questions asked regarding the field material were practical ones: Who is (are) the initiative taker(s)? (Table 2); Is it an initiative that aims at preventing the quantity, the dangerousness, or both of waste? (Table 3); or, at which stage of the material flow does the initiative take place? (Table 4). Then more analytical questions were asked: What does the initiative taker do? Which kinds of actions are waste preventers expected to take? What is the core rationale of the waste prevention activity? The purpose of these questions was to identify what could be considered as core waste prevention actions (Table 5). As described in Corbin and Strauss (2008), the labeling of these core waste prevention actions has been reached by successive iterations, comparing one initiative to the other, labeling and relabeling them, grouping initiatives with similarities, and contrasting ones that answer to different logics of actions. Progressively, the fifty-one initiatives were grouped in the three types of action that are precise enough to render the specificity of each initiative and generic enough to group initiatives that share a similar rationale. All coding has been made by the author.

3. Description of the sample

The sample covers an array of waste prevention initiatives: waste prevention campaigns, exhibitions or show rooms; programs for the reduction of food waste or other spills; promotion of green consumption through social media; development of a method to reduce the use of medical gloves; reparation of objects in plastic; public procurements procedures for waste prevention; clothes rental; or cooking and selling ready to eat meals prepared with food that is close to best before date. (See Appendix 1).

If one uses the typology of the European Week for Waste Reduction (European Week for Waste Reduction, 2015), a little less than half of the initiatives were taken by a public organization or educational establishment (all public), whereas associations, and business and industry stand for just above a quarter each. (Table 2).

Table 2: Composition of the sample by category of the initiative taker

Category of initiative taker	Number of initiatives	% of non-identical initiatives
Public organization	19	37%
Educational establishment	4	8%
Business and industry	14	27%
Association/NGO Network	14	27%
Total	51	100%

If one uses the typology of Arcadis Belgium (2010) that distinguishes among the initiatives that aim at preventing the quantity of waste (quantitative prevention effect effort), the dangerousness of waste (qualitative prevention effect effort), or both (quantitative and qualitative prevention effect effort), no initiative in the sample focuses on preventing the dangerousness of waste, about half aim at a quantitative effect, and half at a combined effect (see Table 3). One should take this repartition with some care, though. Initiatives that aim at reuse or that promote a more sustainable consumption have been classified as a combined effect on the basis that quantitative efforts have a qualitative effect. Other observers, or the initiative takers themselves, may have considered these initiatives mostly as quantitative waste prevention efforts. The telling trait of this way of classifying initiatives in the sample is that there is no initiative that explicitly aims at reducing the dangerousness of waste.

Table 3: Composition of the sample by type of prevention effect

Prevention effect	Number of initiatives	% of non-identical initiatives
Only qualitative (dangerousness of waste)	0	0%
Only quantitative (waste quantity)	26	51%
Both qualitative and quantitative	25	49%
Total	51	100%

Using the typology of Arcadis Belgium (2010), one can also situate where the initiatives take place in all steps of the material flow from design to waste management¹, over extraction, production, distribution, and consumption. (See Table 4). As nearly all initiatives take place across several phases of the material flow, most initiatives have been coded in more than one category so that the number of initiatives listed is higher than the actual number of non-identical initiatives (n=51). Nine out of ten initiatives in the sample deal

¹ The category "waste management" in Table 4 corresponds to a merging of Arcadis's two categories of "waste" and "end-of-waste," a distinction that the author finds obscure.

with consumption, and nearly four out of ten deal with distribution, showing the central role given to consumption in the sample. At the one end of the material flow, there is no initiative about extraction, only two about design, and ten about production. And at the other end, only five initiatives deal with waste management, suggesting that waste prevention is primarily not dealt with as a waste management issue.

Table 4: Composition of the sample by position in the material flow

Material flow	Number of initiatives	% of non identical initiative (n=51)
Design	2	4%
Extraction	0	0%
Production	10	21%
Distribution	19	37%
Consumption	46	90%
Waste management	5	10%
Total	78 > 51 as some initiatives appear more than one time	>100% as some initiatives appear more than one time

4. Findings: Three core types of actions and unanticipated absentees

4.1 CORE TYPES OF ACTIONS

A key finding is that despite their apparent variety, the waste prevention initiatives in this sample boil down to three main types of actions: raising awareness about the need to prevent waste, increasing material efficiency, and developing sustainable consumption (See Table 5).

Table 5: Core waste prevention actions

Core waste prevention actions	Number of initiatives	% of non-identical initiatives (n=51)
<i>Raising awareness</i>		
Raise awareness	18	35%
<i>Increasing material efficiency</i>		
Optimize production	3	6%
Optimize use	4	8%
Optimize the matching of production and use	7	14%
Reduce wastage	1	2%
Promote recycling	1	2%
<i>Promoting sustainable consumption</i>		
Develop sustainable consumption	6	12%
Develop second-hand trade and use	16	31%
Promote repair	2	4%
Reduce consumption	4	8%
<i>Total</i>	63 > 51 as some initiatives appear in more than one category	> 100% as some initiatives appear more than one time

Waste prevention seems to begin with raising awareness. The most frequent waste prevention activity in the sample consists of making the public aware of the environmental and material issues raised by waste and convincing them of the corresponding appropriateness of prevention. Every third initiative in the sample, often older ones, is a campaign, a competition, or an exhibition about waste. The sample's definition of waste prevention starts with creating an understanding that one should not be fully satisfied with the current state of waste management and that waste prevention is superior to landfills, incineration, or recycling. This awareness lays the groundwork for behavior change.

Waste prevention is an emerging societal narrative that questions the current state of waste management (Corvellec and Hultman, 2012) and of consumption and material use (Gregson, 2009; Gregson et al., 2007). As an ideal, waste prevention is the highest step of the European waste hierarchy and thus a key element of European waste governance. For example, some Swedish waste prevention initiatives introduce themselves as an alternative to incineration with energy recovery which is Sweden's dominant waste management solution. In this sense, waste prevention stands in opposition to the current institutional order (Powell and DiMaggio, 1991) of waste management that is locked in the actual management of a material flow called waste (Corvellec et al., 2013) whereas waste prevention aims at preventing the waste flow.

Awareness raising initiatives mobilize environmental and practical reasons to build a problem-solution couple where waste prevention is defined as the best possible solution to the waste problem. By so doing, awareness raising initiatives make it legitimate for other waste prevention initiatives to present themselves as innovative solutions to the waste issue. The tone of waste prevention initiatives ranges from a technical optimism for creating a clean world to alarming dystopias of a world without key materials, appealing thereby to a wide range of political sensibilities.

After having raised an interest for waste prevention, waste prevention initiatives in the sample try to bring about a practical commitment for waste prevention. There is a hint of proselytizing in these waste prevention initiatives. A first way to create commitment for waste prevention is to pursue an

increased material efficiency. About a third of the sample's initiatives intend to improve the material efficiency of production and consumption by optimizing production, optimizing use, optimizing the matching of production and use, reducing wastage, or promoting recycling. The ambition of these initiatives is to let materials better serve their intended uses, for example, that food is being eaten. They outline an ideal where each link in the value chain that goes from extraction to waste management is so efficient that it does not entail wastage, and the chain as a whole is waste free. Some initiatives refer to the lean philosophy (e.g., Dahlgard and Park-Dahlgard, 2006; Womack and Jones, 2003) and its rationale of systematic reduction of defects and spills; and it is only a question of time before initiatives get rewarded that are inspired by cradle to cradle (McDonough and Braungart, 2009) and/or circular economy theory (Ellen MacArthur Foundation, 2013; European Commission, 2014). Waste prevention initiatives that aim at material efficiency strive for excellent processes. Waste is considered as a kind of failure, and waste preventing measures such as spill reduction is a technical remedy for this failure.

A second way to create commitment for waste prevention is to promote sustainable consumption. Sustainable consumption is an open-ended label (Connolly and Prothero, 2003; Fuentes, 2014; Jackson, 2006) (Connolly and Prothero, 2003; Fuentes, 2014; Jackson, 2006). Relying on a combination intrinsic and extrinsic motivations (Cecere et al., 2014), sustainable consumption in the sample stands for developing a guide to sustainable shopping, promoting the purchase of quality products, introducing sustainability on public procurements, promoting repair, or reducing consumption.

Mostly, though, promoting sustainable consumption in the sample stands for promoting second-hand trade and uses. People are encouraged to buy, rent, or swap used objects; they are also encouraged to announce online, put in a re-use room, or divert from disposal what they wish to give away. The rationale is to opt for, promote, and develop a mode of consumption that is supposed to produce less waste than conventional consumption (Ekström, 2015). To simplify, conventional consumption is considered to be the cause of the waste problem, and sustainable consumption, in particular second-hand trade, is featured as a solution to this problem. Second-hand

initiatives stand for a critique of waste-intensive production, distribution, and consumption. But second-hand markets do not reduce the demand for new goods on a one-to-one basis, and under certain conditions, these markets even increase material consumption (Thomas, 2003). To reduce waste volumes, second-hand trade has to fulfill at least two conditions: that the person who supplies the second-hand object does not replace this supply with something new, and that the person who acquires the second-hand object does so instead of acquiring something new. Unless these two conditions are fulfilled, the effect of second-hand trade on waste flows is only one of delaying waste compared with immediate disposal. It is therefore not possible to draw a general conclusion about the effect of second-hand trade on waste volumes since selling and buying second-hand are not mutually exclusive from selling and buying new. However, although the impact of second hand trade on disposal is unclear, as a rule, waste prevention initiatives present second-hand trade as a straightforward, convenient, and effective way to prevent waste, thereby creating a definitional equivalence between trading second hand and preventing waste.

Yet other sustainable consumption initiatives promote a reduction of consumption. These initiatives aim at making people aware of their accumulated consumption, at reducing advertising, or at replacing single use artifacts by ones with multiple uses. The reduction of consumption belongs to the strong sustainable consumption program (Lorek and Fuchs, 2013) and follows a rationale that is radically different from improving material efficacy or developing second-hand trade. Reducing consumption is an action that is in opposition to the current rationale of growth in production, distribution, and consumption. Drawing on as different notions as voluntary simplicity (e.g., Cherrier, 2009; Zamwel et al., 2014), zero waste (Beavan, 2009; Korst, 2012), or de-growth (e.g., Jackson, 2009; Zovanyi, 2013), consumption reducing initiatives say no to what other waste prevention initiatives say yes to, namely an increased throughput of material and energy in the economy (see, e.g., Daly and Farley, 2004). By defining waste prevention as consumption reduction, these initiatives define waste prevention as something radical.

From this sample of the most celebrated initiatives of waste prevention in Sweden in the past 10 years or so emerges a definition of waste prevention

that is structured around three core types of actions: raising awareness that waste is a problem, improving the efficiency of material uses, and developing sustainable consumption.

4.2 UNANTICIPATED ABSENTEES

There are several kinds of initiatives absent from the sample. First, as noted in the methodological section, nearly nine out of ten waste prevention initiatives in the sample pertain to consumption; no initiative is aimed at reducing planned obsolescence, promoting modular production, encouraging standardization, or reducing packaging. The design, production, or distribution phases of the material flow are basically ignored, despite the fact that much more waste is generated during these phases than during the consumption phase, as the World Bank (2013) notes. Likewise, no initiative in the sample touches on measurement, auditing, or evaluation of waste prevention. Such efforts exist in Sweden (e.g., Elander et al., 2014), but they have not been shortlisted.

Second, all but three initiatives are small or medium scale. Except for a national scheme that enables householders to refuse delivery of unaddressed advertisements, a nationwide Web-based marketplace for second-hand goods, and a nationwide chain of thrift shops, actions are taken at the scale of a single school, hospital, store, or association—at most a municipality. There is no example of national action that would impact the management of waste as drastically as the landfill tax that came into force in 2000, the landfill ban on sorted combustible waste in 2002, or the landfill ban on organic waste in 2005 (see, Milios and Reichel, 2013). No action is taken for a higher taxation on material use, a limitation on the use of Styrofoam, a ban on distribution of plastic bags, or a national return system for bottles. The rationale of most, if not all, initiatives is also to promote an activity rather than forbid another. The sample's waste prevention initiatives abide by the *laissez-faire* principle of free entrepreneurship. By so doing, these initiatives define waste prevention as a soft form of governance (Davies, 2009): a policy that rests on individual initiatives rather than on national or international incentive schemes or means of coercion. This differs significantly from how Swedish waste policy has looked like in the last fifty years.

Third, no initiative in the sample takes up mundane actions such as walking or cycling, despite the fact that, regardless if they are aimed at reducing waste or not, these actions produce less waste than car-use. Strangely enough, actions such as walking or cycling are not considered as key waste preventing actions. The reason could be that the initiatives in the sample derive from an understanding of waste that is close to conventional household waste streams, and that they tend to focus on garbage prevention. But waste is more than garbage, and limiting waste prevention to garbage prevention would entail a considerable narrowing of the scope of waste prevention.

Finally, waste initiatives do not necessarily give proof, at least in the open communication that constitutes the bulk of the field material for this study, of a precise waste preventing effect. Waste prevention is more claimed than measured and demonstrated. This may be attributable to the difficulty of expressing the effect of prevention, but it is something worth mentioning.

5. Discussion: A practice-based definition of waste prevention

A three dimensional definition of waste prevention emerges that contrasts with the ostensive definition of waste prevention in, for example, the European Waste Framework Directive. Waste prevention is, at the same time, answering to the waste challenge, developing the technical skills that increase the waste efficiency of processes, and promoting second-hand trade and a reduction of consumption. This definition lets the cognitive meet the technical, the economical, and the political. These definitional elements derive from different types of waste preventing initiatives and correspond to different core actions: raising awareness, improving efficacy, promoting sustainable consumption. (See Table 5)

Table 6: A three-dimensional definition of waste prevention

Core activity	Type of initiative	Definition of waste prevention	Relationship to institutional order
Raising awareness	<ul style="list-style-type: none"> • Campaign • Competitions • Exhibitions 	<ul style="list-style-type: none"> • Cognitive matter: Acquiring knowledge 	<ul style="list-style-type: none"> • Critical of current waste management • In line with the priority given to waste prevention in the European waste hierarchy model
Improving efficacy	<ul style="list-style-type: none"> • Process improvements 	<ul style="list-style-type: none"> • Technical matter: Developing skills 	<ul style="list-style-type: none"> • Supportive of conventional views on production and distribution
Promoting sustainable consumption	<ul style="list-style-type: none"> • Develop second-hand market place • Promote repair • Reduce consumption 	<ul style="list-style-type: none"> • Economic matter: competing with conventional trade • Political matter: conducting a radical anti-consumption policy 	<ul style="list-style-type: none"> • Critical of conventional views on distribution and consumption • Critical of conventional views on production, distribution, and consumption.

Waste prevention appears as something heterogeneous, sometimes contradictory, and evolving. It is heterogeneous in the sense that it is envisioned and brought into practice in different ways, at the same time, and without any of these ways being a-priori superior or more important than another. It is not simply that one can look at waste prevention from different perspectives, for example, an economic or a technical one. Waste prevention takes a cognitive, technical, economic, and political shape at the same time (see: Mol, 2002). It is sometimes contradictory in the sense that the ambitions of waste prevention initiatives can run against one another such as when an initiative says “eat as much as you wish, but eat up” and another insists on self-restraint. And it is evolving since people keep taking new initiatives to pursue new ambitions or try new solutions. Waste prevention is an organizational field (Wooten and Hoffman, 2008) without gatekeepers where all initiatives are free to enter; and once in the field, some initiatives go in one direction and others go in another without any a priori order. Waste prevention is not a certification scheme: there are no specific criteria that one must fulfill to claim the “waste prevention” epithet, and there is no authoritative third party that can take away the epithet from an initiative but the public.

The definitions of waste prevention that derive from waste preventing initiatives are like products on a market. Their market share goes up and down. Some are pioneers whose merits are only acknowledged a long time after they have disappeared. Others are path-breaking, disruptive innovations that define or re-define from day one the terms of the market. Yet others are followers that manage to draw successful lessons from the mistakes of failed pioneers. A waste prevention initiative can become a symbol of waste prevention, or it may never break through and be immediately forgotten. Will tools, clothes, or car sharing schemes become paradigmatic forms of waste prevention, or will they stand as unfortunate early attempts? The future of waste prevention is as uncertain as any future. No one can know how existing initiatives will evolve, which ones will disappear, which new initiatives will erupt, and which one will become less, or more, popular.

The European Waste Framework Directive comes with a definition that builds on outcomes—reducing the quantity, impact, and dangerousness of waste; but this definition misses that waste prevention is a multiplicity

of organized actions. Prevention is something people do, and in practice there is no fixed or established definition of what waste prevention is. Waste prevention is something ambiguous, developed on arbitrary grounds, with uncertain outcomes, and with an indeterminate future. The laundry list of waste preventing measures that one can find in Annex 4 to the European Waste Framework Directive or Sweden's national plan for waste prevention (Naturvårdsverket, 2015 [2013]) are perceptive in this regard. By mixing the promotion of eco-designs with awareness campaigns or voluntary agreements among producers, they produce a realistic, albeit not complete, picture of the multi-sidedness of waste prevention. Annex 4 in the European Waste Framework Directive and Sweden's national plan for waste prevention capture that waste prevention can take many different forms, and that it is up to waste preventers to show what waste prevention can be. And as new waste prevention initiatives gain ground, the definition of waste prevention evolves—in its diversity, contradictions, promises, and limits.

Each waste prevention initiative also supports a specific view of what waste is, how acceptable it is, how important it is to reduce it, and how this can be done. As Lynch (1990) explains, how we relate to waste tells much about how we relate to nature, wealth, space, time, and ultimately ourselves. Correspondingly, every waste prevention initiative can be seen as an offer made to its public to view waste in a different way.

Waste decision makers, practitioners, and waste scholars therefore need to understand that waste prevention is a multisided social change process: it sheds new light on waste; sets new priorities for production, consumption, and waste management; requires new actions from individuals as well as companies and authorities; and demands dedicated legal, physical, and human infrastructures.

6. Conclusion

This report shows that waste prevention initiatives are not only initiatives that are openly claiming to reduce the quantity, dangerousness, or negative impact of waste as defined in the European Waste Framework Directive. Actually, an initiative does not need to be defined as waste preventing by those who originate it for others to consider it as waste preventing. For example, an entrepreneur can open a shop for vintage bicycles for aesthetic reasons with no waste prevention in mind, but still be considered as contributing to waste prevention. Starting from actual initiatives, one can follow the entrepreneurial and organizational richness of waste prevention and how diversely waste prevention can be interpreted.

Scholars and policy makers are invited to consider waste prevention to be just as dynamic as production, consumption, and disposal practices. Waste prevention initiatives change character all the time; as some come to an end, new ones appear and enter the field. Priorities of waste prevention should therefore aim at creating favorable conditions for generating waste preventing dynamics: leading a reflection on the legislative, economic, and technical lock-ins that impede the development of waste prevention; observing where waste prevention is coming from and where it is heading; critically assessing the waste preventing effects of waste preventing initiatives; constructing the equivalent of business incubators or science parks for entrepreneurs with an interest in waste prevention; dedicating urban space for waste prevention initiatives to grow; and welcoming the kind of contradictions that this article identifies in Swedish waste prevention as an indication of a diversity that contributes to dynamism.

Waste governance would benefit from adopting a definition of waste prevention that is richer than the formal definition provided in the European Waste Framework Directive. A practice-based definition makes it possible, instead, to encompass all kinds of waste preventing actions: the ones that succeed and the ones that fail, the ones that exist already and the ones that are still to come. Most importantly, it creates an understanding of the richness of the organizational dynamics of waste prevention.

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Appendix 1: Presentation of the studied initiatives

#	Initiative taker	Category	Waste preventing activities undertaken by the initiative taker	Waste preventers and the activities they are to undertake to prevent waste	Stages	Effect	Core waste prevention activity
European Week for Waste Reduction (EWWR) awards 2009							
1	Eurest (food services, Winner)	B	<p>Inform restaurant staff and guests on food waste and European Week on Waste Reduction</p> <p>Train staff in</p> <ul style="list-style-type: none"> - Planning menus and portions - Weighing food waste <p>Train guests in</p> <ul style="list-style-type: none"> - Taking one napkin only - Not taking more food than one can eat 	<p>Staff and guests:</p> <ul style="list-style-type: none"> - Become more aware about waste problem <p>Restaurant staff:</p> <ul style="list-style-type: none"> - Improve efficacy of the delivery process - measure quantity of non-eaten food that to assess inefficacy <p>Guests:</p> <ul style="list-style-type: none"> - Change consumption behavior / Do not take too much food 	P D C	Qt	<p>Raise awareness</p> <p>Optimize the matching of production and use</p>
2	The Association for Sustainable Consumption (Finalist)	A	<p>Inform the public on the effect of consumption on workers and the environment through social media</p> <p>Promote alternative modes of consumption</p> <p>Provide support for sustainable consumption decision making (Ecoguide, app)</p>	<p>The association for sustainable consumption:</p> <ul style="list-style-type: none"> - Inform <p>Consumers:</p> <ul style="list-style-type: none"> - Become more aware about waste problem - Change consumption behavior to more sustainable consumption 	D C	Qt QI	<p>Raise awareness</p> <p>Develop sustainable consumption</p>
EWWR awards 2010							
3	Def.Waste (association of municipally owned waste management companies, Finalist)	P	<p>Organize regional exchange of information</p> <p>Promote alternative modes of consumption</p> <p>Organizes awareness raising activities for citizens (e.g, gift vouchers for events/experiences)</p>	<p>Waste management company:</p> <ul style="list-style-type: none"> - Show alternative modes of consumption - Reduce waste flow <p>Consumers:</p> <ul style="list-style-type: none"> - Become more aware about waste problem - Change consumption behavior (experience instead of an object) 	C Wm Ew	Qt QI	<p>Raise awareness</p> <p>Develop sustainable consumption</p>

4	Municipality of Västerås, Bjurhovda school (Finalist)	E	Improved <u>food handling</u> in the school restaurant Information on food waste Competition among pupils to reduce food waste	Staff and guests: - Raise their awareness about food waste problem Staff: - Improve efficacy of the food delivery process Guests: - Change their consumption behavior	P D C	Qt	Raise awareness Optimize the matching of production and use
5	City of Göteborg, Environment Authority	P	Stages waste reducing events - Production of the "A world without waste" film - Organize exchange tables - Organize rock concert	Public authority - Inform Consumers: - Raise their awareness about the waste issue	D P D C	Qt Ql	Raise awareness
EWWR awards 2011							
cf4	Municipality of Västerås, Bjurhovda school (Winner)						
6	The Association for Sustainable Consumption (Finalist)	A	Offer an interactive app to motivate consumers to buy/sell second hand	Consumers: - Buy and sell second-hand to replace new stuff	D C	Qt Ql	Develop second hand trade and use
7	Gästrike Återvinnare: Think before! campaign (Municipally-owned waste management company)	P B	Promote more sustainable consumption practices, e.g.: buy quality products, repair, rent, and borrow, buy and sell second hand, exchange and give away, avoid food waste	Distributor - Develop another way of looking at waste Consumer - Develop more sustainable consumption behavior	C	Qt Ql	Raise awareness Develop sustainable consumption
8	Association Agenda 21: Youth parliament for a sustainable development	A	Organize a yearly one-day forum on sustainable development for young people	Consumers: - Become more aware about waste problem - Change consumption behavior to more sustainable consumption	C	Qt Ql	Raise awareness Develop sustainable consumption
9	Tyréns AB (consulting company) and Region Skåne	B P	Advise a hospital on how to apply a lean methodology	Public organization: - follow routines inspired by lean methodology to minimize spill from purchase to disposal	C	Qt	Optimize use

EWWR awards 2012							
10	IKEA Jönköping (furniture retailer)	B	<ul style="list-style-type: none"> - Communicate on food waste reduction - Weigh food waste - Remove disposable containers for salt, sugar, and pepper - Sell lunchbox to customers for 0,5 € 	Service provider <ul style="list-style-type: none"> - Inform - Replace disposable packaging with non-disposable 	D C	Qt	Reduce wastage
11	Gästrike Återvinnare: Art Space and Waste Race events (Municipally-owned waste management company) (Nominee)	P	Waste-based art competition	Customer: <ul style="list-style-type: none"> - Become more aware about the environmental impact of waste 	C	Qt Ql	Raise awareness
12	The association of sustainable consumption: Twitter campaign Ecopledge (Nominee)	A	Twitter-based campaign / challenge	Consumer: Change consumption behavior <ul style="list-style-type: none"> - Avoid buying water in plastic bottle - Avoid new plastic bags - Make less print - Ask for a doggy bag - Go to the shoe repairman 	C	Qt Ql	Raise awareness
13	Municipality of Örebro, (Nominee)	P	Waste cycle exhibition for children	Consumers (pupils): <ul style="list-style-type: none"> - Raise awareness about waste 	Wm Ew	Qt	Raise awareness
EWWR awards 2013							
14	SYSAV: Don't buy junk campaign (Municipally-owned waste management company)	P	Web-based test that describes for the person taking the test her level of waste production	Public authority: <ul style="list-style-type: none"> - Inform Customers: <ul style="list-style-type: none"> - Reduce consumption 	C	Qt Ql	Raise awareness Reduce consumption
15	Bjussa (trans: Treat) (social entrepreneur) (Nominee)	A	Exchange platform <ul style="list-style-type: none"> - Promote giving away things - Promote reuse 	Service provider <ul style="list-style-type: none"> - develop and maintain the platform Suppliers <ul style="list-style-type: none"> - give away things Consumers <ul style="list-style-type: none"> - opt for re-use 	D C	Qt Ql	Develop second hand trade and use

16	Fazer (food services) (Nominee)	B	Describe how Fazer works to reduce food waste: production, distribution, reverse logistics	Producer: - Describe how a food company (bread, restaurants) can work to prevent food waste	P D C	Qt	Raise awareness Optimize the matching of production and use
17	City of Gothenburg, Lindholmen Technical High School (Nominee)	E	Inform on food waste volumes	Consumers (pupils) - "Eat as much you will, spill as little you can."	C	Qt	Raise awareness
18	City of Gothenburg, Kajmans birthday party campaign	P	Raise awareness of children about origins and consequences of consumption	Public authority: - Informs Customers (children/parents): - Produce toys of their own - Reduce consumption	C	Qt Ql	Raise awareness Develop sustainable consumption
Recycling gala / Waste preventer of the year (2014: was the first edition for this category)							
19	NSR: Very little!" campaign (Municipally-owned waste management company) (Winner)	P	Explain drivers, obstacles, and triggers of recycling and waste prevention behavior	Waste management company works with: - social norms - recycling routines - alternative forms of consumption - developing responsibility - social status of recycling and waste prevention - accessibility - effects of individual efforts	C	Qt Ql	Raise awareness
20	Sundsvalls Hospital (Nominee)	P	Collect data on food waste Analyze structural and processual issues Inform and train	Hospital - Improve efficacy of the delivery process - use quantity of food that is not eaten as a measure of inefficacy - involve staff and guests (co-creation)	P D C	Qt	Optimize the matching of production and use
21	Plastreparations bolaget (Private company) (Nominee)	B	Repair services for plastics objects	Plastic reparation company: - Offer repair services Customer - Opt for repair instead of buying new	P	Qt Ql	Promote repair
European research project Pre-waste (www.prewaste.eu)							

22	City of Gothenburg, Alelyckan re-use Park	P & A	Give waste disposers the possibility to divert items from disposal/recycling to repair and re-use Organize the presence of thrift shops for repair and re-use	Waste management company: - Operate the park - Organize presence of thrift shops - Offer infrastructure (large hall for visitors) Consumers give away instead of throwing away Retailers (Thrift shops) repair and sell	C Wm Ew	Qt Ql	Develop second hand trade and use
23	Municipality of Halmstad, Schools authority	E	School authority: food waste competition - Establish a baseline value - Inform canteen personnel. - Organize workshops with schools - Inform pupils - Weigh food waste on a daily basis for three weeks. - Present results for each school daily - Media for external dissemination	Service provider - Measure - Communicate Consumers (Pupils) - Serve (themselves) adequate portions	C	Qt	Raise awareness
24	The Borrow Closet (association)	A P)	Rental of quality clothes	Producer / Designers: - Act as sponsors. Service providers: - Create and operate the rental service (e.g., attract sponsors, monitor quality) Consumers (members): - Register for the Borrow closet - Replace buying with borrowing	C	Qt	Develop second hand trade and use
cf1	Eurest						
Report: Avfall Sverige, best cases of waste prevention, edition 2011							
Cf 22	Alelyckan re-use Park						
Cf 24	Lånegarderoben						
25	Fullriggaren (real estate owner) and Sunfleet (car sharing company)	B	Collaboration between real-estate owner and car-sharing company	Sun Fleet: - provide car pool services Real-estate owner (Fullriggaren): - Provide room for car pool Consumers: - Use car pool services instead of owning a car	D C	Qt Ql	Develop second hand trade and use
Cf 1	Eurest						

26	City of Gothenburg, Environment Authority	P	Raise awareness of staff and guests Measure food waste Reduce spill at production and consumption	Restaurant: - Measure - Benchmark - Revise portioning Consumers (guests): - Do not take more than they eat - Develop new attitudes	C	Qt	Raise awareness Optimize production and use
27	ICA Malmborgs Tuna, Lund: The Resourceful Chef (Food retailing company)	B	Cook and sell meals prepared with food that is close to best before date	Service provider/Resourceful Chef: - Identify and use food that comes close to before date for the preparation of meals Customers: - Purchase take away meals	P D C	Qt	Optimize production
28	Chalmers University Gothenburg	E	Paper waste reduction campaign	Facility management company: - ask to refrain from using more than one paper towel after hand washing. Customer: - limit one's use of paper towels	C	Qt	Optimize use
29	"No ads, please" – signs (national system)	B A P	Offer the possibility to say no to unaddressed advertisements	Householders put on their door that they do not want to receive unaddressed advertisements. Direct advertising distributors do not deliver unsolicited advertisement to this household.	D C	Qt	Reduce consumption
30	Gästrike Återvinnare: Garbage truck parade (municipally-owned waste management company)	P	Organize a parade with waste collection trucks to visualize the daily volume of waste in the city	Waste management company: - Visualize waste volumes	Wm	Qt Ql	Raise awareness
31	Pay as you throw (PAYT) systems (diverse locations)	P	Separate food waste collection and introduce weight-based fee for unsorted waste collection	Waste management companies develop PAYT systems Householders opt in for PAYT system	Wm	Qt	Promote recycling Reduce consumption
32	Milou (association of private and public organizations)	P	Public procurement for a sustainable development	Public organization: - introduce life cycle analysis (LCA) in public procurement	C	Qt Ql	Develop sustainable consumption

33	Allwin (private company)	A B P	Collect and redistribute food that would otherwise be thrown away	Allwin: - Connect people with an oversupply of food to people in need of food support Producers, Distributors, Public organizations: - Give away unused food Customers (people in need): - Accept food provision from Allwin	D C	Qt	Optimize the matching of production and use
Report: Avfall Sverige, best cases of waste prevention, edition 2015							
34	Off2Off (private company) and Malvin (City of Malmö)	B P	Enable departments within the City of Malmö to re-use its operational surpluses	Departments within the City of Malmö that want to get it rid of something operational deliver it to Malvin that then makes it available to all other municipal departments.	C	Qt Ql	Optimize use
35	Municipalities of Gällivare and Laholm	P	Buy and use reconditioned computers	Selling party: - Deliver functional and cleansed computers for use Municipalities: - Buy and use reconditioned computers - Give away computers for re-use and reconditioning	C	Qt Ql	Develop second hand trade and use
Cf 20	Sundsvall hospital	P	Improve effectiveness of food supply to hospital patients	Different departments of the Sundsvall hospital work at increasing the fit between the food that is served and the ability of the patient to eat it.	P D C	Qt	Optimize the matching of production and use
36	Municipality of Hässleholm, Elderly care "Kaptensgården"	P	Apply a lean methodology to reduce unnecessary use of incontinence pads	Elderly care home (different departments): - increase the fit between the incontinence pads in use and the need of the patient.	C	Qt	Optimize the matching of production and use
37	Studio Re:Design (association of private and public organizations)	A B	Use production spill from textile industry to create new products and promote sewing and repair	Producers / Distributers/Associations: - Give away textiles Studio Re:design: - Produce models and inspire Association: - Organize classes and develop production of its own Consumer: - Buy Redesigned products	D P D C	Qt	Develop second hand trade and use

38	Gästerike återvinnare: Re-use and recycle map (municipally-owned waste management company)	P	Web-based sites and app to finding second hand retail, recycling centers, vintage shops, flea markets	Public organization: - Inform Consumers: - Sell/Buy second hand	D C	Qt Ql	Develop second hand trade and use
39	Exchange day for toys, Linköping (collaboration of municipally-owned companies)	P	Organize yearly exchange day for toys	Public organization: - organize event Children/parents: - Swap toys	C	Qt	Develop second hand trade and use
40	ReToy (Social entrepreneur)	A P	Organize toys related activities: - Swap - Repair - Teach human rights	Public organizations open for ReToy ReToy organizes swap and repair, and teaches human rights Children/parents participate	C	Qt	Develop second hand trade and use
41	Erikshjälpen (charity) + Pentecost church	A	Thrift shops collaborate with waste management company and real estate company to collect and sell second-hand furniture primarily to students	Association collects Waste management company aids to collect Real estate company provides local Consumer (students) purchase second hand	C	Qt Ql	Develop second hand trade and use
42	Bostadsbolaget, Göteborg: Re-use room (public benefit housing company, Göteborg)	P)	Provide and maintain room for free exchanges of artifacts	Real estate company: - provide and maintain room for free exchanges of artifacts Consumers: - swap	C	Qt Ql	Develop second hand trade and use
43	The Cycle Kitchen (association)	A	Recondition bicycles, teach how to repair bicycles	Association teaches and provides tools and local Consumers (bike users) repair	C	Qt	Promote repair
44	Food Emergency (best cases report)	A	Collect and redistribute food	Connect people with an oversupply of food to people in need of food support	D C	Qt	Optimize use
45	Restaurant Karavan (private company)	B	Sell last remaining lunches as take away for a reduced price	Restaurant sells remaining food for take away Consumers (guests) develop new lunch habits	P D C	Qt	Optimize production
46	KeepCup (retailing)	B	Sell reusable / refillable coffee cups	Producer sells refillable cup	C	Qt	Reduce consumption

	company)			Consumers avoid single-use cups			
47	Free-time Bank (association)	A	Exchange of free-time wares	Free-time bank lends material Swedish Church, Municipality of Forshaga, and An Open Värmland project support the Free-time Bank Consumers opt for borrowing instead of buying	C	Qt	Develop second hand trade and use
48	Malmö Järnhandel (ironmongery company)	B	Tool pool	Retailer lends out tools Consumers borrow tools	D C	Qt Ql	Develop second hand trade and use
Retur 2014, Public housing re-use competition							
49	Renovation plinth (private company)	B	Sell a plinth that can be fixed over another plinth when renovating flats	Renovation firm uses the "renovation plinth"	P	Qt	Optimize production
Avfall Sverige: Miljönär campaign (- A game on words where the Swedish term for environment replaces the term million in millionaire)							
50	Blocket (private company)	B	Web-based market place for second-hand	Blocket offers and maintains web-platform Consumers: Sell and buy	C	Qt Ql	Develop second hand trade and use
Cf 40	ReToy						
51	Myrorna (Salvation Army)	A	Second hand shops	Households give away Charity association collects, selects and sells Consumers buy second hand	D C	Qt Ql	Develop second hand trade and use

ABBREVIATIONS:

Cat. = Category of initiative taker; P=Public organization; E=Educational establishment; B=Business and industry; A=Association/NGO Network; =Other

Effect = Prevention effects; Qt = Quantitative/Quantity of waste; Ql=Qualitative/Dangerousness of waste

Stages = Material flow stages; D=Design; E=Extraction; P=Production; D=Distribution;C= Consumption;Wm=Waste management;Eow=End of waste phase

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Municipality of Örebro, Waste and recycling: www.orebro.se/5977.html

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Alelyckan re-use park: http://www.prewaste.eu/index.php?option=com_k2&view=item&id=368&Itemid=101

Halmstad schools: http://prewaste.eu/index.php?option=com_k2&view=item&task=download&id=500&Itemid=94

The Borrow Closet (Lånegarderoben): http://www.prewaste.eu/index.php?option=com_k2&view=item&id=190&Itemid=101

Fullriggaren & Sunfleet: <https://sunfleet.com/bilpooler/malmo/hamnen/vastra-hamnen-fullriggaren/>

Environment Authority, City of Göteborg: www.mindrematsvinn.nu/dotnet/

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Gästerike återvinnare, Re-use and recycle map: <http://gastrikeatervinnare.se/karta-och-oppettider/>

Exchange day for toys: www.familjensdag.se

ReToy: www.retoy.se

Erikshjälpen and Pentecost church: <http://www.erikshjalpen.se/secondhand/vaara-butiker/lund-studentbutik/>

Bostadsbolaget (Göteborg), Re-use room: <https://www.bostadsbolaget.se/Om-bostadsbolaget/Pressrum/Pressmedelande-nyheter/Inramat-aterbruksrum-invigt/>

The Cycle Kitchen (Cykelköket): www.cykelkoket.org

Food Emergency: Report: Avfall Sverige best cases of waste prevention, edition 2015

Restaurant Karavan: www.restaurandkaravan.se

KeepCup: <http://icingonthecake.se>

Free-time Bank (Fritidsbanken): www.fritidsbanken.se

Malmö Järnhandel (trans: Malmö ironmongery): <http://malmojarnhandel.se/maskinuthyrning/>

Renovation plinth: www.sabo.se/aktuellt/nyheter_s/2015/feb/Sidor/Vinnare-av-Retur-2014,-allm%C3%A4nnnyttan-%C3%A5terbrukst%C3%A4vling.aspx

Blocket: www.blocket.se

Myrorna (Thrift shop driven by the Swedish section of the Salvation Army): <http://myrorna.se>

Waste prevention in Sweden 2008-2015 - An analysis of key waste prevention initiatives

The increasing importance being placed on waste prevention in Swedish waste governance raises the question of how waste prevention is defined in practice. This paper presents a qualitative analysis of a sample of fifty-one key Swedish waste prevention initiatives with the purpose of identifying which kind of actions are imagined, promoted, and set into motion under the label of waste prevention. The analysis shows that despite their apparent variety, the initiatives in the sample boil down to three main types of actions: raising awareness about the need to prevent waste, increasing material efficiency, and developing sustainable consumption. In contradistinction to the formal definition of waste prevention in the European Waste Framework Directive (2008/98/EC), what emerges from analyzing the initiatives in the sample is a definition of waste prevention as something heterogeneous, contradictory, and evolving. Such a definition of waste prevention in practice provides an understanding of the entrepreneurial and organizational dynamics of waste prevention.



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