



Deliverable 10.5

POLICY PACKAGING AND ITS APPLICABILITY TO THE WATER MINING PROJECT
A SUMMARY OF A CONCEPT AND METHODOLOGY

Date: 30 December 2020



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 869474.

Deliverable 10.1	Project management guidelines
Related Work Package	WP 10
Deliverable lead	Yamit Naftali
Author(s)	Yamit Naftali, Dr. Jeff Dodick
Contact	Yamitn@jerusalemstitute.org.il
Reviewer	Philipp Kehrein, Dr. Dimitris Xevgenos
Grant Agreement Number	869474
Instrument	Innovation Action
Start date	1st September 2020
Duration	48 months
Type of Delivery (R, DEM, DEC, Other) ¹	R
Dissemination Level (PU, CO, CI) ²	PU
Date last update	24 December 2020
Website	www.watermining.eu
Name of researcher(s) with roles	Yamit Naftali, Dr. Jeff Dodick, Dr. Dan Kaufmann

Revision no	Date	Description	Author(s)
0.1	30 November 2020	First draft	Yamit Naftali, Dr. Jeff Dodick
0.2	17 December 2020	Review	Philipp Kehrein
0.3	29 December 2020	Review and additions in §6	Dr. Dimitris Xevgenos
1.0	30 December 2020	Final version	Yamit Naftali



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement 869474.

¹ **R**=Document, report; **DEM**=Demonstrator, pilot, prototype; **DEC**=website, patent fillings, videos, etc.; **OTHER**=other

² **PU**=Public, **CO**=Confidential, only for members of the consortium (including the Commission Services), **CI**=Classified

-Deliverable 10.5-

An early version of this paper was developed in the frameworks of the SPREE (FP7) and R2 π (H2020) Projects. The policy packaging method was developed (in part) by Prof. Eran Feitelson & Elah Matt from the Jerusalem Institute of Policy Research, in accordance with the needs of SPREE. According to the insights gained from the process, in the R2 π project we used a simpler methodology which focused on the first two layers, basic and effective. In this project framework, we are adapting this methodology to the needs of the (H2020) Water Mining Project.

We would like to thank the SPREE and R2 π consortia and their policy packaging teams for their work and insights.

**SPREE report authored by: Elah Matt, Moshe Givoni, Bryan Epstein (Tel Aviv University)
Eran Feitelson (The Jerusalem Institute Policy Research, The Hebrew University)**

R2 π authored by: Yamit Naftali and Dr. Jeff Dodick (The Jerusalem Institute for Policy Research)

Table of Contents

1. Executive Summary	6
2. Background and Introduction	9
3. Why are Policy Packages Needed?	12
4. What is a Policy Package?	15
5. The Ingredients of Policy Packages	18
5.1. The Basic Package	20
5.2. The Effective Package.....	21
5.3. The Viable Package	23
5.4. The Total Policy Package	24
6. Implications/applicability for the WATER-MINING Project	26
7. Conclusions?.....	31

List of Figures

Figure 5-1: The policy packaging process in the Water Mining project consisting of six stages.19

Figure 6-1: Implementation plan of policy packaging methodology within WATER-MINING project .30

List of Tables

Table 5-1: Typology of Interactions among Policy Instruments.....21

Table 5-2: Policy Package Sub-Packages and Connected Components25

Table 6-1: Impact regarding implementation and improvement of EU policies by case studies28

1. Executive Summary

Advancing water technology and Circular Economy (CE) actions in a manner that effectively increases the availability of water, while improving the environment, as proposed in the Water Mining framework, will necessarily involve the application of many policy tools in the three water subsector forms (resource, consumable and durable) in which the Water Mining technologies are to be advanced. The ability to do so effectively is premised on the ability to implement those policies concurrently in a manner that is both effective and viable. This report reviews and summarizes the policy packaging approach, as a way to tackle these challenges.

Policy packaging has been advanced in recent years as a way to combine seemingly disparate policy tools into coherent sets (packages) in a manner that enhances synergies among them, as well as their acceptability and implementability. Policy packages are thus synergic combinations of policy tools geared to effectively achieve policy goals, while minimizing unintended effects, and enhancing the package's legitimacy and viability.

Policy packages are comprised of three sub-packages compiled in six stages. The first is the *basic package*, which is a package that can be expected to reach the desired policy goals. The second is the *effective package*, which is the combination of measures that enhances the synergies between measures and minimizes unintended effects. The purpose of this package is to increase the net effectiveness of the policies; in other words, it maximizes benefits, while taking into account rebound effects. The effective package, includes ancillary measures that mitigate undesired effects of the *basic package*. The third package is the *viable package*, which assesses social and political acceptability while also identifying the barriers that may affect the selected instruments. This third package takes thus into account the local political

and institutional realities that often impede the adoption and effective implementation of the desired policies.

Overall, the policy package will have, as its core the basic package, which is structured around the primary instruments, and assures that direct, immediate effectiveness is achieved. However, this package is insufficient, due to possible unintended effects, and to the question whether the basic package is acceptable and feasible. Hence, the policy package will include ancillary measures and actions that will increase its net effectiveness and will increase the likelihood that it will be adopted and then implemented. Overall, this package will be one that strives not only to increase the effectiveness of the intervention, but also to reduce the transaction costs of implementing it. Hence, it may include measures that will enhance its social acceptability, as well as measures intended to bring critical actors on board, or to mitigate the opposition of adversely affected power groups.

The policy packaging process comprises six stages. The first stage comprises the definition of objectives and targets. Then, in stage two, an inventory of measures to advance the objectives and targets is created. In stage three, this set of policies are evaluated according to effectiveness and implementability in order to identify the ‘low hanging fruits’ – measures that have a high likelihood of advancing the goals at a low cost, as well as high-potential to be implemented. These first three stages result in the Basic Package.

In the fourth stage, the relation types between the measures is examined; measures that are needed as pre-requisites for other measures should be listed, as well as measures that may complement them or contradict them. In the fifth stage the measures in the basic packages will be further scrutinized and mapped based on causal relationships to identify potential unintended consequences. Ancillary measures to annul these contradictions, and/or increase the effectiveness of the policy packages will be added. At this point the *Effective Package* will be in place.

The Viable package building process begins with the sixth stage which involves identifying the winners and losers of each instruments and of the whole package on the public and political level. Additionally, different types of barriers (financial, technological, technical know-how and institutional) are identified that may affect the selected instruments. These stages are completed with the help of expert judgment.

Building upon the insights gained from SPREE and the R2Pi projects, we have decided to use a methodology which will focus on previously mentioned three layers: Basic, Effective and Viable.

This report is structured as follows. Following this Executive Summary, we provide basic background on policy packages in [Chapter 2](#). In [Chapter 3](#), we answer the question concerning why policy packages are needed. In [Chapter 4](#), we rigorously define what a policy package is. In [Chapter 5](#) the components comprising policy packages are detailed, largely following Feitelson's (2003) definitions; these components include the Basic, Effective and Viable sub-packages. Finally, in [Chapter 6](#) we discuss the application of policy packaging to the Water Mining Project.

2. Background and Introduction

The extraordinarily complex nature of contemporary public policy is well recognized. Efforts to advance policies in incremental steps or by single policy measures often fail, leading to calls for “integrative” and “holistic” policies that incorporate multiple policy instruments (EC, 2007; Givoni & Banister, 2010; Lafferty & Hovden, 2003; Ling, 2002; Rafaj et al., 2006). As the OECD (2007, p. 433) notes: “the complexity of many environmental challenges means that a mix of policy instruments will be needed.”

Advancing the shift from the broad concept of a Circular Economy (CE) to more specific Circular Economy Business Models (CEBM), as proposed in the Water Mining framework, is no exception in this regard. It will necessarily involve the application of many policy tools to the three forms of water (*resource, consumable and durable*) as defined by the Water Mining consortium, in which CEBMs are to be advanced. The ability to do so effectively is premised on the ability to implement those policies concurrently in a manner that is both acceptable and effective. The challenge that WATER-MINING will face in the latter stages of the project implementation is to combine the policy instruments, which were identified as desirable in earlier stages, in a manner that the potential synergies between them are utilized, while possible contradictions neutralized.

The need to advance a slew of policy measures to advance complex multi-faceted programs has been well recognized (Auld et al., 2011; EU, 2007; OECD, 2007). This is particularly true when sustainability programs are concerned, not least due to the multiple facets of such programs (Persson, 2004). In practice, however, most of the strategies that are formulated to advance complex multi-faceted programs are not implemented (Steurer, 2007). This is not surprising, as the pitfalls inherent in formulating and coordinating policies, even in focused policy arenas, has been recognized and studied since the 1970s (i.e. Pressman & Wildavsky,

1973; Bardach, 1977). Stuerer (2007), like many others, argues consequently that implementation issues, as well as the coordination of policies, need to be taken into consideration early, already in the policy formulation stage. Recent works such as Geyer and Rihani's (2010) *Complexity and Public Policy* and the Australian Government's (2007) *Tackling Wicked Problems*, for example, have stressed the need for policymakers and civil servants to overcome organizational boundaries, to interact with citizens and stakeholders and to engage in flexible creative and systemic thinking which is "holistic" rather than linear or partial in character.

The purpose of this report is to review and summarize the policy packaging approach, as a way to tackle these challenges. Policy packaging has been advanced in recent years as a way to combine seemingly disparate policy tools into coherent sets (packages) in a manner that enhance synergies among them, as well as increase their acceptability and implementability.

Policy packages have been defined by Givoni et al (2013, p.3) as: "a combination of policy measures designed to address one or more policy objectives, created in order to improve the effectiveness of the individual policy measures, and implemented while minimizing possible unintended effects, and/or facilitating interventions' legitimacy and feasibility in order to increase efficiency". Thus, Givoni and his colleagues distinguish between policy packages and assemblages of individual policy measures that otherwise exhibit spatial and temporal co-presence. This definition also differentiates between policy packages and integrative policies, as the latter usually imply the widening of the set of policies to include additional facets, often without regard to the interactions between the policy measures that are advanced or their implementability.³

³ See Biswas (2004) for a critique of policy integration concerning water resource management.

While policy packaging approaches have been advanced mainly in the transportation field (e.g. Feitelson, 2003; Givoni et al., 2013; May & Roberts, 1995), they are applicable in other sectors as well, such as agriculture (Pereira et al., 2017), and water (Feitelson et al., 2013; Fischhendler and Zilberman, 2005) sectors. Also, this approach has been implemented in the *Sustainability Outlook for Israel 2030* project, where over fifty policy tools were suggested to advance nine strategies dealing with a very wide array of issues and scenarios (JIIS, 2013). Most recently, in the framework of the R2Pi project, six sector's policy packages⁴ were designed to advance the implementation of Circular Economy Business Models (**CEBMs**) in Europe.

⁴ The six sectors are: water, construction, textile, electronics, building and food.

3. Why are Policy Packages Needed?

In recent decades, many wide ranging strategies have been proposed to stem environmental deterioration while enhancing environmental performance in various fields or sectors. These strategies have been advanced at all levels of governance, from the global through the regional and national to the local level. In some of these strategies, such as the British initiative to reduce GHG emissions from transport (Hickman et al, 2008) or the OECD's (2011) initiative to green consumer behavior, the need for policy packages was explicitly noted. In all strategies a wide array of instruments is usually advanced (Jordan & Lenschow, 2008). However, in most cases the instruments actually advanced are not analyzed critically in terms of the inter-relations between them, and hence are largely a kind of "instrument shopping list." In some cases, they are differentiated according to whether they are regulative, incentives or informational (Bemelman-Videc et al., 1998), and/or according to the stage in the policy process in which they are applicable. The Network for Business Sustainability (2011), in one notable example, reviewed 242 policy instruments that were differentiated according to the authority to implement them, the stage in the policy process (to which they were applicable) and type of instrument (regulative, incentive or informational). But these strategies do not come up with a synergic set of tools, or relate to the possible unintended effects one policy tool may have for the application of other tools.

While environmental policy strategies advance a wide array of tools, policy evaluation studies tend to focus on one or a few policy instruments. Such studies usually identify a number of limitations with their individual instruments, affecting their implementation and/or rendering them ineffective even after they had been formally adopted (Bardach, 1977; MacLaughlin, 2005). In many cases such policies are found to have unintended ramifications that were not perceived or not discussed when the policies were adopted (Goodwin, 2003). Therefore, one

of the most frequent recommendations of such studies is that the evaluated policy tool should be augmented by complementary measures that will enhance the effectiveness of the evaluated measure or mitigate its unintended effects (OECD, 2007; 2011, for examples). Such unintended effects may contradict in some cases the goals of other instruments that are advanced within the same strategy or integrative policy framework. For example, while reducing parking availability may reduce car-based travel and resulting GHG emissions, as well as the coverage of open spaces by asphalt, it may also lead to longer searches for parking, which in turn increases GHG emissions, thereby leading to suggestions for new instruments, such as taxing the provision of existing parking (Feitelson & Rotem, 2004). Concurrently, studies of such 'new' instruments also tend to focus on a limited set of instruments from quite narrow perspectives, often finding them lacking as well (Jordan et al., 2013).

The limitations identified in the evaluation literature are not restricted to the effectiveness of the instruments or their unintended effects. In many cases such policy instruments also have distribution implications (OECD, 2011). Thus, some stakeholders benefit from their application, while others are adversely affected. Such two way effects are often unavoidable. The question largely boils down to which parties are adversely affected. If the weaker strata of society or a very wide stratum bear the burden of the new tools, these policy tools may be seen as socially unacceptable. If strong interest groups are adversely affected, the policy tools may be seen as politically infeasible. This seems to be the main impediments in the widely touted proposals for road pricing as noted by Feitelson and Salomon (2004), as well as Schade and Schlag (2003).

Finally, as Bardach (1977) demonstrated early on, the fact that a certain policy tool is adopted does not mean that it will necessarily be implemented. Once a policy tool has been officially adopted it is likely to face a wide set of explicit or implicit factors and forces which will strive to deflect its funds and purpose toward other policy goals. In this 'implementation game', as

Bardach terms it, the players are often different from those that were involved in the earlier stages when the policy was initiated and discussed. The players involved in these latter stages have their own interests and goals and hence often try to advance their own goals at the expense of those that underlay the original formulation of the policy tool.

Studies that analyzed “success stories”, such as Cervero’s (1998) study of successful public transport systems, almost invariably show that several policy instruments were used in these cases in a complementary manner, thereby exploiting the synergies between the policy tools (OECD, 2007). But while such studies note the importance of using complementary policy measures and synergies, they do not propose how such synergies can be exploited in other cases.

On the basis of the literature it is quite obvious that single policy tools are unlikely to successfully advance policy goals. This is even more difficult when wide-ranging programs, requiring the utilization of multiple instruments, are advanced. What is needed is a structured approach to the combination of different policy instruments in order to increase the likelihood of success. To this end, policy packages which take into account the synergies, cross-cutting effects of policy tools, as well as their social and political acceptability, are argued as being a better answer towards designing effective policy solutions.

4. What is a Policy Package?

The need to employ multiple instruments to advance wide policy goals is well-known (Bemelmans-Videc et al., 1998; OECD, 2007). But much of the literature focuses on the typology of policy tools. Vedung (1998), for example, follows Etzioni in differentiating policy tools into incentives, restraints ('sanctions' in Etzioni's terminology) and information ('normative tools' according to Etzioni). This most --widely used typology differentiates policy tools according to whether they provide an incentive to change behavior, regulate behavior through command and control policy or try to encourage a change through normative means, by changing norms (Auld et al., 2011). Other typologies have been advanced by May and Roberts (1995) for the transportation sector and by Eggenberg and Partidario and (2012) in the spatial planning field.

Hickman and Banister (2007) utilized the aforementioned typology in order to advance policy packages for reducing GHG emissions due to transportation. Essentially, they advanced policy tool combinations, whereby each combination includes different tools from the same category. Thus, they proposed an incentive package, a regulative package and a normative tools package. But they did not analyze the inter-relations between tools from different categories.

It can be argued, however, that typologies are not meaningful, as it is unimportant from what category a tool is. What is important is the effect that it has on behavior. In essence, the difference between regulations and incentives is largely one of definition, as from a behavioral perspective both generate a set of benefits and costs for the behavioral agent. Regulations also generate such benefits and costs as agents can ignore the regulations at a probabilistic cost of the fines they will incur if caught. Consequently, the emphasis should be

placed on the behavioral effects the various policy tools generate rather than on their category.

Additional dimensions that may be of importance are the temporal and spatial dimensions. Thus, Feitelson et al. (2010) suggested that policy tools should be classified according to a spatial scale which is correlated with government level, and the temporal scale as it takes time to implement a tool, and for the tool to have an effect. Their approach is similar to that of Bemelmans-Videc and Vedung (1998), for whom policy packaging can take three distinct forms: (1) vertical packaging – employing measures at different governmental levels, usually implying that measures implemented by higher-level governance induce compatible actions by lower tier levels; (2) chronological packaging – where there is a certain time-order in the selection of measures; (3) horizontal packaging – which involve the simultaneous deployment of two or more measures aimed at the same target group.

Van der Doelen (1998) took policy packaging one step further by suggesting that they are formulated systematically step by step. Essentially, policy measures are to be evaluated by their contribution to achieving the policy goals; their legitimacy; the extent to which they require coercion; and whether they encourage or limit behavioral changes. On this basis, he suggests that measures are added or deleted in order to balance between the restrictive measures (“sticks”), such as regulations or taxes, which are necessary from an effectiveness perspective, and incentives (“carrots”) that are important in order to make the package acceptable. This approach has been advocated widely in the transportation sector (Ben-Elia & Ettema, 2009, for example).

In the past few years a number of studies took Van der Doelen’s approach further by looking at additional dimensions of policies and packages, beyond his incentive/disincentive typology. These studies, mainly those by Feitelson (2003), Teighagh et al. (2013) and Givoni et al. (2013), strive to maximize not only the effectiveness of the packages, but also to improve both their



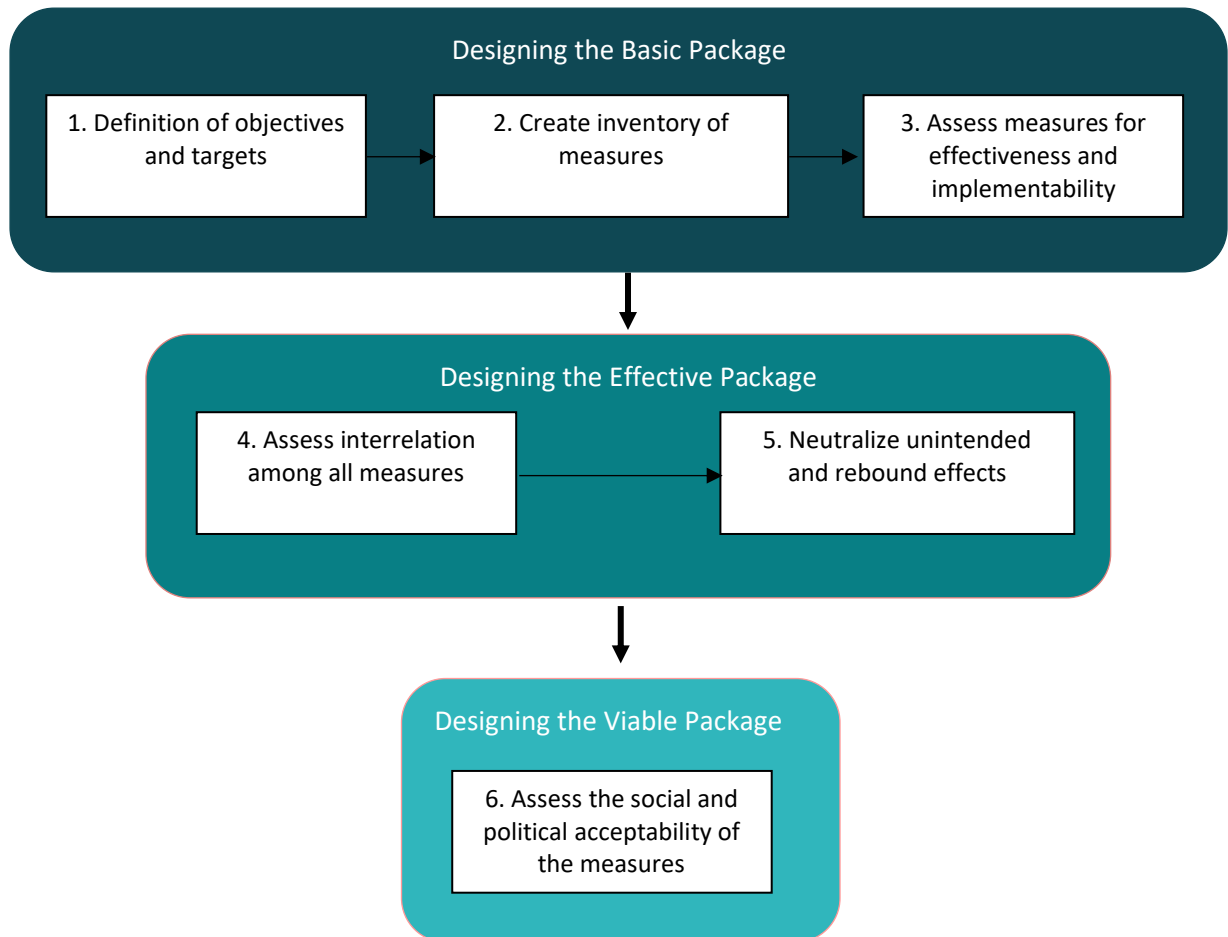
social and political acceptability, by focusing on inter-relations between measures. These packages, which are the focus of the rest of this report, thus strive to enhance policy effectiveness in achieving its goals but also make them acceptable both socially and politically.

The policy packages advanced herein are thus synergic combinations of policy tools geared to effectively achieve chosen policy goals, while minimizing unintended deleterious policy effects, and enhancing the package's legitimacy and feasibility.

5. The Ingredients of Policy Packages

Following Feitelson (2003), policy packages consist of four sub-packages, which are compiled sequentially. The first is the *basic package*, which is a package that can be expected to reach the desired policy goals. The second is the *effective package*, which is the combination of measures that enhances synergies between measures and minimizes unintended effects. The purpose of this package is to increase the net effectiveness of the policies, meaning, to maximize their benefits, while taking into account rebound effects (Givoni et al., 2013). The third is the *acceptable package*. This is a package that includes ancillary measures in order to mitigate undesired negative effects of the basic package. The fourth is the *feasible package*, which includes steps that are necessary to overcome the implementation issues identified by Bardach (1977), and the potential opposition of interest groups and vested interests. In the (H2020-funded) WATER-MINING Project we will not implement this fourth package, as based on Feitelson (2003), but instead combine some of the elements from each into what is called a viable package based on the formulation of (Pereira et al., 2017). The three sub-packages and the factors that affect their formulation are detailed in the next sub-sections. A schematic diagram of the entire policy packaging process is seen in Figure 5-1 below.

Figure 5-1: *The policy packaging process in the Water Mining project consisting of six stages.*



5.1. The Basic Package

All policy interventions consist of policy measures, also referred to as policy tools or policy instruments. These measures are advanced as a means to address a policy problem, which is the frame that is used to explain an undesired phenomenon which the policy strives to rectify (Weiner & Vining, 1999), or as means by which an intended policy goal is to be reached. Hence, the first stage in the policy packaging process is the definition of objectives and targets that address that problem.

Then, in stage two, an inventory of measures to advance the objectives and targets is created. Hickman et al. (2008), for example, identified 120 measures in their inventory pertaining to low-carbon urban mobility in London. These possible measures are the set from which the basic package will be formed.

However, a basic package does not need to include all, or even most, of them. Rather, it will comprise a sub-set that will be coherent and effective. To this end all the possible instruments have to be evaluated, in stage three. The evaluation needed to formulate the basic package is connected to the degree to which a policy instrument can be expected to further the policy goals, or address the policy problem as it has been framed, and the costs associated with its application. On this basis, it is possible to conduct either a cost-benefit (CBA) or a multi-criteria decision analyses (MCDA), based on effectiveness and implementability criteria, in order to identify the “low hanging fruits”; in other words, the policy measures which provide the best options for reaching the policy goals at the minimal cost. These are the primary measures around which the basic packages are structured. It is possible, however, to retain also highly effective though costly measures, as these costs may be mitigated in the subsequent stages.

5.2. The Effective Package

Taeihagh et al. (2013) widen the usually MCDA approach by use of network theory. To this end they assess the interactions among all the policy measures considered. They identify five interrelations: pre-conditions, facilitation, synergetic, potential contradiction and contradiction. These are summarized in Table 5-1, below. Due to the difficulty in differentiating between facilitating and synergetic relationships and between potentially contradictions and contradictions, Givoni et al. (2013) reduce these interrelationships to three: (1) *pre-conditions* – where the successful implementation of one policy measure is wholly contingent upon the prior successful implementation of another; (2) *synergetic* – where the function of one measure is enhanced by the presence of another measure; (3) *contradictory* – where the conflicting presence of two or more policy measures has detrimental effect on the functional capacity of either or both. These are the types of relations that have been used also in the *Sustainability Outlook for Israel 2030*. We will follow Givoni et al.'s (2013) suggestion in the Water Mining Project by using the three interrelationships.

Table 5-1: Typology of Interactions among Policy Instruments

Interaction	Description of Interaction
Pre-conditions	Needed step or policy instrument for the implementation of a desired policy instrument.
Facilitation	An interaction that makes the desired instrument more effective.
Synergetic	A two-way interaction that increases the benefits of using two or more instruments concurrently beyond that which can be achieved by using each separately.
Potential contradiction	A potential that the use of one instrument may make the use of another less effective.

Interaction	Description of Interaction
Contradictory	A clear contradiction between two instruments.

Source: Taeihagh et al. (2013)

By mapping the relationships in the fourth stage of the policy packaging process it is possible to identify measures that are central to a wide set of other measures. This was empirically derived from the project: *Sustainability Outlook for Israel 2030*. These central measures can be considered as primary measures in addition to the “low hanging fruits” noted above. In other words, the basic package thus comprises the primary measures, the measures that constitute the pre-conditions to the primary measures, and the measures which have synergetic effects with the primary measures. This package is likely to achieve *immediate effectiveness*, which is defined by Givoni et al. (2013, p. 6) as: “the degree of operative influence an intervention directly exerts upon its intended objectives.”

The immediate effectiveness strived for in the basic package pertains only to the direct effects of the instruments on the policy goals. However, policy instruments may have indirect effects too. These may be in the form of rebound effects, or an outcome of the unintended contradictory effects generated by other instruments included in the basic package. These determine the collateral effectiveness of the package. Hence, the *net effectiveness* is the sum of the immediate and collateral effectiveness by neutralizing rebound and unintended contradictory effects (Givoni et al., 2013). An effective package is one that strives to maximize the net effectiveness. To this end it is necessary to widen the analysis to include the indirect effects too, which occurs in the fifth stage of this process.

Examples of indirect effects abound. Givoni and Banister (2012), for example, show that the introduction of high speed rail in Europe has increased train ridership, thereby having a positive immediate and direct effect. Nonetheless, there is a very limited shift from other,

more polluting modes; hence, its collateral (positive) effect on the environment is low or zero. Moreover, as it generates additional travel, which is complemented by car travel, it also has a negative collateral effect. Thus, it is necessary to complement the policies promoting the use of high speed rail with other measures that will lead to a shift from more polluting modes, if there is to be an environmental benefit (net effectiveness) (Givoni et al., 2013). While such *ancillary measures* can have a direct immediate effect, they are primarily intended to facilitate the function of one or more of the primary measures. To this end a good understanding of the behavioral and causal relations of the primary measures is necessary.

Almost invariably, public policy problems in general, and environmental policies in particular, are “multi-aspect” (OECD, 2007). Even when there is one primary goal other considerations cannot be ignored. In most cases, however, there is more than one explicit goal. In such cases it is necessary to analyze the effects of all policy measures on all goals (Feitelson, 2003). It is quite likely that such analyses will reveal tradeoffs between goals. Hence, it is necessary in such cases to analyze the marginal benefit the use of a measure generates in terms of one of the goals vis-à-vis the marginal contradictory effects it may have on another goal. The effective package in this much more complex case will have to identify the net effectiveness in terms of all goals (OECD, 2007).

5.3. The Viable Package

In the viable policy package, social and political acceptability is assessed. This means that expert judgment is required in order to, first, identify the winners and losers of each of the instruments and of the package as a whole, both on the public and political level; and second, identify the different types of barriers (financial, technological, technical know-how and institutional) that may affect the selected instruments. This process, which comprises the sixth stage of the policy packaging process, therefore requires the proposal of strategies and actions to overcome these barriers. To carry out these steps in the Water Mining Project, the

methodology will be based on the judgement of the policy packaging team members, the communities of practice and on the organization of a stakeholder's workshop. Stakeholders will be selected based on their expertise thus giving them the ability to contrast their view with the work team about the policy package procedure and results.

Such stakeholder meetings begin by explaining the main concepts to be discussed, including designing a policy package. Afterwards, the workshop participants are asked to discuss the policy package potential to reach its goals, as well as identifying the main factors potentially hindering the implementation of the policy package, including economic, political and social factors. The whole discussion is recorded and, at the end of the workshop, the leader of the session summarizes its main insights. This last step contributed to verifying that the package is effective and largely implementable within a specific situation.

5.4. The Total Policy Package

The three sub-packages described in the previous sections (basic, effective and viable), which will be applied to the Water Mining Project are constructs whose purpose is to systematically structure the entire policy package. Their integration comprises the policy package which will be presented to Stakeholders and the communities of practice connected to the Water Mining Project. This package is in essence the evolutionary compilation of the three packages presented above.

The policy package will have at its core the basic package, which is structured around the primary instruments, and assures that the direct immediate effectiveness is achieved. However, this package is insufficient, due to possible rebound and unintended effects, and to the question whether the basic package is acceptable and feasible. Hence, the policy package will include ancillary measures and actions that will increase its net effectiveness and will increase the likelihood that it will be first adopted and then implemented. Overall, this package will be one that strives not only to increase the effectiveness of the intervention, but

also to reduce the transaction cost of doing so. Hence, it may include measures that will enhance its social acceptability, as well as measures intended to bring critical actors on board, or to mitigate the opposition of adversely affected power groups.

Table 5-2 summarizes the components of the policy package.

Table 5-2: Policy Package Sub-Packages and Connected Components

Sub-package	Connected Components
Basic	Primary measures + pre-conditions
Effective	Basic package + synergetic measures - Contradictory measures (and / or + ancillary measures to mitigate unintended effects)
Viable	Effective Package + measures to enhance social and political acceptability + measures to enhance the feasibility

6. Applicability for the WATER-MINING Project

Designing and implementing Circular Economy initiatives for the Water Mining Project involve a very wide variety of actions. These pertain to both the different government levels and different water sub-sector forms (resource, consumable and durable) as expressed in the case studies⁵. Regardless of government level and form of water, the introduction of CE concepts is likely to encounter opposition and obstacles. It is claimed here that policy packages will prove useful in the introduction of many CE concepts. However, the level at which it is introduced, national, regional or local, as well as form of the water, will determine the actors which will be involved and the stakeholders that will have an interest in the specific CE concept at hand. The relationships between actors, institutional structures, legal frameworks and stakeholders are likely to vary across settings. Therefore, the application of the policy packages, as outlined in this report, will have to be adapted to the level of government at which it is applicable, as well as the technologies dealing with the three water forms. Still, several common features of the process can be identified. In essence, the stages outlined above should be followed in all cases, regardless of government level, and form of water.

The overall aim of the policy packaging in the Water Mining project is to stimulate the successful adaptation of Water Mining technologies by addressing both market failure (business, financing, consumers) and policy failure (pricing, conflicts, assumptions, unintended consequence). In this context the case-studies analyses will help to identify the barriers and obstacles in the different sub-sectors which the policy packages should address. These will differ across sub-sector. Hence, in the Water Mining Project context, the policy

⁵ In the context of the Water Mining Project, there are three sub-sectors: resource (based on case studies 1 and 2), consumable (case studies, 3, 4 and 5) and durable (case study 6).



packaging process will draw upon the six case-studies teams who are distributed among the three different forms of water to design three policy packages.

In the Water Mining Project the teams will implement the three sub-packages, Basic, Effective and Viable.

Regarding the design of the Basic Package, the policy packaging teams will define the goals based on the characteristics and challenges connected to each form of the water. Following this step, the teams will build a policy inventory. This will be implemented based on the methods of Givoi et al. (2013) and Feitelson (2003) without changes.

Concurrently, with the development of the Basic Package, the policy packaging team leaders will conduct an analysis of policy gaps and best practices. This analysis will be based on policies already published by the EU and state authorities. Some of the policies that will be analysed are found in Table 6-1 below.

Table 6-1: Impact regarding implementation and improvement of EU policies by case studies

No	Legislation / Regulation or other Policy document such as communication (COM), Staff Working Document (SWD)	CS1: SELIS	CS2: PSA	CS3: TUDELFT	CS4: LARNACA	CS5: ACSA	CS6: HEXION
1	Directive 2000/60/EC: " Water Framework Directive "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	Directive 2008/98/EC: " Waste Framework Directive "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	Directive 2009/28/EC: " Renewable Energy Directive "		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
4	COM(2018) 97 final: " Action Plan: Financing Sustainable Growth "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	Regulation (EC) No 1907/2006: " REACH regulation "			<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>
6	Directive 86/278/EEC: " Sewage sludge directive "			<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	
7	Directive 91/271/EEC: " Urban Waste Water Treatment Directive "			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
8	Directive 91/676/EEC: " Nitrates Directive "			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
9	Directive 98/83/EC: " Drinking Water Directive "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
10	Directive 2010/75/EC: " Industrial Emissions Directive " - BREF documents						<input checked="" type="checkbox"/>
11	Decision C(2013) 8589 regarding the BREF on " Chlor-alkali production "						<input checked="" type="checkbox"/>
12	Circular Economy Package, including:						
12.1	COM(2015) 614 final: " An EU action plan for the Circular Economy "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12.2	COM(2018) 29 final: " Monitoring framework for the circular economy "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12.3	COM 2018/337: " Minimum requirements for water reuse "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12.4	SWD(2018) 36 final: " Report on Critical Raw Material "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>				
12.5	OJ, 14.6.2018, L 150: " Revised Waste Legislative Framework "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12.6	COM(2016) 157: " Regulation proposal for CE market fertilizing products "				<input checked="" type="checkbox"/>		
12.7	COM(2019) 190: " Implementation of the Circular Economy Plan " and the	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12.8	accompanying document SWD(2019) 90 on the progress of the 54 actions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
13	COM(2019) 640 final: " EU Green Deal "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
13.1	Annex to the Green Deal: " Roadmap – Key actions "	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

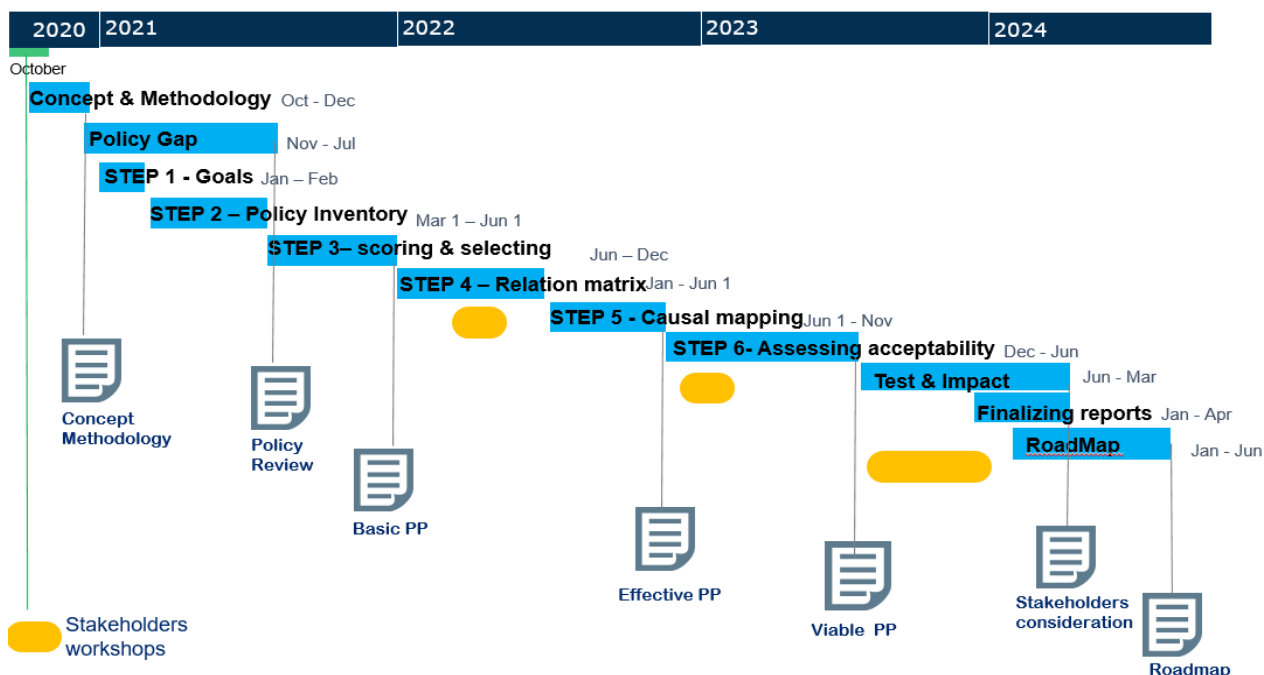


Regarding the Effective Package, it should be noted that when analyzing the interrelationships between the policies, the teams will follow Givoni et al.'s (2013) suggestion of using the following three interrelationships: pre-condition, synergetic, and contradiction.

Finally, concerning the Viable Package, it should be noted that this combines some elements of Feitelson's (2003), acceptable and feasible packages, while closely following the formulation of Pereira et al. (2017).,The Viable Package construction will be based on the judgement of the policy packaging team members, the communities of practice and on the organization of a stakeholder's workshop. Stakeholders will be selected based on their expertise thus giving them the ability to contrast their view with the work team about the policy package procedure and results.

The Policy packaging methodology timeline applied within the WATER-MINING project is found in Figure 6-1, below.

Figure 6-1: Implementation plan of policy packaging methodology within WATER-MINING project



As can be seen in Figure 6-2, the Policy packaging process will extend over the four-year timeline of the Water Mining Project. The Basic Policy Package will be submitted after completing the first three steps in December 2021. The Effective Packaging which consists of steps 4 and 5, will be delivered in November 2022. As part of the process the Effective Package will be shared with stakeholders to receive their important feedback. The Viable Package, consisting of step 6, will be completed in June 2023; this step is based on workshops with our stakeholder group, as mentioned above. In the next 9 months (June 2023 – March 2024) the policy packages will be tested for impact with stakeholders via roundtables, conferences and workshops. The insights gathered in these different forums will permit the policy packaging teams to finalize their reports. Concurrently, the road map for implementing the policy packages will be designed.

7. Conclusions

This report presents the policy package approach to advancing policy instruments. It defines what policy packages are, why they are needed, and the elements from which they are composed. In addition, the report outlines an approach by which policy packages can be formulated. This approach is presented in this report in an outline form.

Finally, this report provides some guidelines for the application of the policy packaging approach to the CE and its application to circular water systems, as defined within the Water Mining Project.

As noted in the previous section, the degree to which policy packages will be used, as well as the extent and sophistication of the packages is likely to vary according to the attributes of the CE concept that is advanced, as well as the institutional setting and stakeholders in the specific sub-sector and country. Hence the formulation of basic, effective and viable policy packages will require innovative, context-sensitive work for it to be successful.

References

Auld G., Burlica, B., Mallet, A., Nolan-Poupart, F. and Slater R. (2011). *When do Climate Policies Work? A Review of Experiences from low Carbon Technology Promotion and Water Management*. Network for Business sustainability. Retrieved from: nbs.net/knowledge.

Bardach E. (1977). *The Implementation Game: What Happens after a Bill becomes a Law?* Cambridge, MA: MIT Press.

Bemelmans-Videc M-L and Vedung, E. (1998). Conclusions: Policy instruments types, package choices and evaluation. In M-L. Bemelmans-Videc, R.C Rist and E. Vedung (Eds), *Carrots, Sticks and Sermons: Policy Instruments and their Evaluation* (pp. 249-274). New Brunswick, NJ: Transaction Publishers.

Ben-Elia, E. and Ettema, D. (2009) Carrots versus sticks: Rewarding commuters for avoiding the rush-hour: A study of willingness to participate. *Transport Policy*, 16, 68-76.

Biswas A. (2004). Integrated water resources management: A reassessment. *Water International*, 29, 248-256.

Cervero, R. (1998). *The Transit Metropolis: A Global Inquiry*. Washington, DC: Island Press.

European Commission (EC). (2007). *Integrated Environmental Management: Guidance in Relation to the Thematic Strategy on the Urban Environment*. Technical Report 2007-13. Retrieved from: https://www.ccre.org/docs/guide_environment_mangement.pdf

Eggenberg M. and Partidario M.R. (2012). Development of a framework to assist the integration of environmental social and economic issues in spatial planning. *Impact Assessment and Project Appraisal*, 18, 201-207.

Feitelson, E. (2003). Packaging policies to address environmental concerns. In D. Hensher and K. Button (Eds.). *Handbook of Transport and the Environment* (Vol. 4, pp. 757-769). Amsterdam: Elsevier.

Feitelson, E. (2010). Policy packaging: Why and how? Paper presented at the 8th *Transport Practitioners Meeting: Ideas and Reality*, York, UK, July 2010.

Feitelson, E. and Rotem, O. (2004). The case for taxing surface parking. *Transportation Research*, 9(4):319-333.

Feitelson, E. and Salomon, I. (2004). The Political Economy of Transport Innovations. In M. Beuthe, V. Himanen, A. Reggiani and L. Zamparini (Eds), *Transport Developments and Innovations in an Evolving World* (pp. 11-26) Berlin: Springer Verlaag.

Fischhendler, I. and Zilberman, D. (2005). Packaging policies for reforming the water sector: The Californian experience. *Water Resources Research*, 41(7), 1-14..

Geyer, R. and Rihani, S. (2010). *Complexity and Public Policy: A New Approach to 21st Century Politics, Policy And Society*. Abingdon Oxfordshire, UK: Routledge.

Givoni M. and Banister D. (Eds.). 2010. *Integrated Transport: From Policy to Practice*. Abingdon Oxfordshire, UK: Routledge.

Givoni M. and Banister D. (2012). Reinventing the wheel: Planning the rail network to meet the mobility needs of the 21st century. In: A. Frenkel, P. Nijkamp and P. McCann (Eds.), *Societies in Motion: Innovation, Migration, and Regional Transformation*. Cheltenham, UK: Edward Elgar Publications.

Givoni M., Macmillen J., Banister D. and Feitelson, E. (2013). From policy measures to policy packages. *Transport Reviews*, 33, 1-20.

Goodwin P. (2003). Unintended effects of policies. In D. Hensher and K. Button (Eds.), *Handbook of Transport and the Environment* (Vol. 4, pp. 603-613). Amsterdam: Elsevier.

Hickman, R. , Ashiru, O. , Saxena, S. , Bradbury, A. , and Banister, D. (2008). Visioning and Backcasting for Transport in London (VIBAT London) Study. Stage 1, 2, and 3 Reports. Halcrow Group and University of Oxford for the UrbanBuzz Programme. Halcrow Group, London, 2008. www.vibat.org

Hickman, R. and Banister, D. (2007). Looking over the horizon: Transport and reduced CO₂ emissions in the UK by 2030. *Transport Policy*, 14, 377-387.

Jerusalem Institute for Israel Studies (JIIS). (2013). *Israel Sustainability Outlook 2030*. Jerusalem Institute for Israel Studies: Jerusalem.

Jordan A. and Lenschow A. (Eds.). (2008). *Innovation in Environmental Policy? Integrating the Environment for Sustainability*. Cheltenham, UK: Edward Elgar.

- Jordan, A., Wurtzel, R.K.W. and Zito, A.R. (2013). Still the century of 'new' environmental instruments? Exploring patterns of innovation and continuity. *Environmental Politics*, 22, 155-173.
- Lafferty, W. and Hovden E. (2003) Environmental policy integration: Towards an analytical framework. *Environmental Politics*, 12(3), 1-22.
- Ling, T. (2002). Delivering joined-up government in the UK: Dimensions, issues and problems. *Public Administration*, 80, 615-642.
- MacLaughlin, M.W. (2005). Listening and learning from the field: Tales of policy implementation and situated practice. In A. Lieberman (Ed.) *The Roots of Education Change: International Handbook of Educational Change* (pp. 58-72). New York, NY: Springer-Verlag.
- May A. and Roberts M. (1995). The design of integrated transport strategies. *Transport Policy* 2, 97-105.
- OECD. (2007). *Instrument Mixes for Environmental Policy*, OECD Publishing, Paris: OECD Publishing. Retrieved from: <https://doi.org/10.1787/9789264018419-en>
- OECD (2011). *Greening Household behavior: The Role of Public Policy*, OECD Studies on Environmental Policy and Household Behaviour. Paris: OECD Publishing, Paris. Retrieved from: <https://doi.org/10.1787/9789264096875-en>
- Pereira, Á., Carballo-Penela, A., Guerra, A. and Vence, X. (2017). Designing a policy package for the promotion of servicising: A case study of vineyard crop protection in Galicia (Spain). *Journal of Environmental Planning and Management*, Vol. 61(2), 348–369.
- Persson A. (2004). *Environmental Policy Integration: An Introduction*. Stockholm: Stockholm Environment Institute.
- Pressman J. and Wildavsky, A. (1973). *Implementation: How great expectations in Washington are dashed in Oakland*. Berkeley, CA: University of California Press.
- Schade J. and Schlag B. (2003). *Acceptability of Transport Pricing Strategies*. *Transportation Research Part F* 6, 45–61.
- Steurer R. (2007). From government strategies to strategic public management: an exploratory outlook on the pursuit of cross-sectoral policy integration. *European Environment* 17, 201-214.

Taeihagh A., Givoni, M. and Banaras-Alcantara R. (2013). Which policy first? A network-centric approach for the analysis and ranking of policy measures, *Environment and Planning B*, 40, pages 595 – 616.

Van der Doelen F.C.H. (1998). The "give and take" packaging of policy instruments: Optimizing legitimacy and effectiveness. In M-L. Bemelmans-Videc, R.C Rist and E. Vedung (Eds), *Carrots, Sticks and Sermons: Policy Instruments and their Evaluation* (pp. 249-274). New Brunswick, NJ: Transaction Publishers.

Vedung E. (1998). Policy instruments: Typologies and theories. In M-L. Bemelmans-Videc, R.C Rist and E. Vedung (Eds), *Carrots, Sticks and Sermons: Policy Instruments and their Evaluation* (pp. 129-148). New Brunswick, NJ: Transaction Publishers.

