



A System Perspective for Policy Analysis and Understanding: The Policy Process Networks

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Abstract

This paper introduces the Policy Process Networks (PPN) as a new framework for policy understanding and analysis. PPN combines the strengths of the Policy Cycle and the Policy Networks' approaches with the systems thinking ideas of dynamic process and interdependencies. I argue here that different actors' networks participate in the different stages of the policy process and influence each other as well as the stages' outcomes. Therefore, in order to better understand how policies are shaped, why, and by whom, a PPN methodology is introduced as a mean for a systematic and comprehensive policy analysis. This methodology is utilized in a case study explaining the formation of Air Emissions policy in Israel.

Key Words:

Policy analysis, Policy networks, Policy process, Policy cycle, Environmental Policy, System thinking.

Introduction

Public policies are one of the main means through which order is set in societies and large systems, such as states, are governed. Public policies also play a key role in introducing changes to societies and in altering individual and collective behaviour. Therefore, analysing the process through which public policies are shaped and implemented and detecting its strengths and weaknesses are the first steps for understanding how we may design policies that improve order and governance and bring to an effective change. Seeing policymaking processes as soft systems (Mulgan 2001), this paper suggests a new framework for policy analysis and understanding, which utilizes the systems thinking ideas of dynamic processes and multiple interdependencies.

Policymaking is a complex ongoing process that stretches over long periods of time and involves many interests and participants, which may vary along the course of time. Policies are context influenced and are embedded in national, economical, political, cultural, and social structures and contexts. As a result, policies, like soft systems (Checkland 1981), are extremely actors-context-sector-site-issue dependent and specific.

In order to better understand the complex process of policymaking, and to improve the process of policy making itself, much effort is dedicated to policy analysis. The policy literature suggests a plethora of perspectives and frameworks for policy analysis. The Policy Cycle framework is one such framework. It aims to disaggregate the complex phenomenon of policy formation into manageable steps (Bridgman and Davis 2003). It suggests breaking down the process into its sequence stages and examining what happens in each stage separately while assuming that one stage influences the following (Howlett and Ramesh 1995).

The Policy Networks (PN) perspective offers a different way to tackle some of the complexities involved in policymaking processes. Focusing on the meso-level, it considers the effect of both governmental and non-governmental actors on the policy process. PN perspective concentrates on the cluster of interests in the process as well as on the relations between the actors who participate in the policy process - the network - and seeks to explain policy outcomes by these characteristics (Marsh and Rhodes 1992). Cooperation, patterns of information flow, joined strategies, as well as other characteristics of the actors' inter-relations in the network are the main mean through which PN aim to explain policy outcomes.

Yet, both perspectives ignore some important aspects of policymaking and are limited in their ability to explain and predict policy outcomes. Combining systems ideas of interdependency and dynamics (Richmond 1993) with both the Policy Cycle perspective and PN perspective, this paper suggests a new framework for understanding the policy process. I argue here that each individual policy process actually involves - and is therefore governed by - several different networks: the Policy Process Networks (PPN). Each stage of any policy process is governed by a specific network - the Stage Network. This network structure and characteristics are shaped by the institutions and the procedures that govern the stage, and by the interactions between actors who have interest in the specific stage and who have access to relevant decision making forums. Furthermore, each stage network operates in the context of, and in relation with other stages' networks. The outcomes of each policy stage can be explained by its network characteristics and by opportunities and constraints imposed by other stages' networks. Following the logic of the PPN perspective, this paper suggests a new methodology to carry out case studies which enables analysing the policy formation as an ongoing, dynamic, interdependent and in context process.

The rest of the paper continues as follow: The first section briefly discusses the Policy Cycle and PN literatures and its main drawbacks. The second section presents the concept of PPN as a new system thinking driven perspective for understanding policy formation and as a new methodology for policy analysis. The third section utilizes the PPN methodology for analysing and explaining the formation of Air Emissions policy in Israel. The concluding section suggests the potential of PPN perspective for future policy research.

Policy Cycle

The Policy Cycle framework suggests that the policy process develops along sequential logical stages of problem solving, in which policy decisions are made by decision makers, with one stage informing the next (Bridgman and Davis 2003). "*Decision-making*" claim Howlett and Ramesh (2003:162) "*is not a self-contained stage, nor is it synonymous with the entire public policymaking process. Rather it is a specific stage rooted firmly in the previous stages of the policy cycle*".

Albeit variations, the policy cycle usually includes the following stages: Agenda setting, problem definition and analysis, policy tools selection, implementation, enforcement and evaluation (Howlett and Ramesh 2003). It is widely agreed that policy cycle, as a framework, is an ideal type from which every reality curves away (Bridgman and Davis 2000, Howlett and Ramesh 2003). In actuality, different stages are sometimes shaped simultaneously and there may be a succession of feedback loops (Hill 2005).

The rationale for observing each stage separately - which is similar to Bertalanffy (1968) hard systems logic - is that each stage differs from the others in the sort of activities it involves, the expertise it requires, and the procedures that govern it. Another important insight contributed by the stages model is the understanding that different stages provide different sets of outcome, which affect other stages, even if they occur simultaneously. Differentiating between the stages activities, procedures, outcomes, and other characteristics reveals that the interests in shaping each stage outcomes vary between actors and affect the actors' participation.

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A critique of the policy cycle as a framework for policy understanding highlights three main issues: (1) its lack of theoretical ability to predict policy outcomes (Jenkins-Smith and Sabatier 1993), (2) its notion that public policies are dominated and led by administrators rather than by other actors (Jenkins-Smith and Sabatier 1993, Colebatch 2005), (3) its focus on the bureaucratic process while disregarding content and context aspects (Everett 2003) and intergovernmental relations (Jenkins-Smith and Sabatier 1993). As a model for policy analysis, it also adheres too much to the normative process and for imposing schematic stages on what actually happens (Hill 2005). Despite criticism, this concept is useful for disaggregating the web of policy transactions and for examining the process through which policies are made (DeLeon 1999, Pielke Jr. 2004)

Policy Networks

The Policy Networks (PN) approach emerged as a meso-level framework for policy theory and analysis. It is based on the understanding that policies are not shaped solely by governmental agencies but are rather outcomes of some sort of interactions and relations between governmental agencies, private sector actors and civil society actors. PN usually include “*all actors involved in the formulation and implementation of a policy in a policy sector. They are characterized by predominantly informal interaction between public and private actors with distinctive, but interdependent interests, who strive to solve problems of collective action on a central, non-hierarchical level*” (Borzel 1998: 260).

The PN perspective considers not only actors but also factors like economic characteristics and market changes. Changes that occur in one or more of the arena dimensions - such as institutional, ideological, economical or technological - can alter the network's structure, and, in turn, influence the policy outcomes (Marsh and Rhodes 1992). Therefore, this perspective is preferred as an analytical perspective when dealing with complex policy issues that involve many actors and interests, such as environmental issues, owing to its ability to capture multiple coexisting interests that are presented by different actors in the policy arena (For example: Van Bueren, Klijn and Koppenjan 2003).

A wide agreement exists among many policy scholars that networks affect the policy process and its outcomes (Marsh and Rhodes 1992, Marsh 1998). Yet, this perspective is criticized for being largely descriptive rather than predictive (Mills and Saward 1994, Dowding 1995, McPherson and Raab 1988). Other PN critiques emphasise the missing linkage between network models and models of the policy process (Sabatier 1991, Peters 1998), and on the lack of attention to the dynamics that motivate actors within the network and acts as a catalyst to the process (Peters 1998).

Indeed, the networks literature fails to capture the dynamic aspect of policymaking processes, the manner through which one stage leads to the following, and the interdependencies between the stages. PN literature tends to explain policy outcomes by focusing on the characteristic of one dominant network and fails to differentiate between policy stages. Consequently, it fails to capture how the network's components and structure change – sometimes completely – along the policy process. It tends to neglect the fact that different actors have different access to policymaking forums in the various stages. It also overlooks the modifications that elements – such as actors' interests, power positions, resources, know-how, and legitimacy – go through from stage to stage. Using systems thinking terminology, I argue that the PN literature (1) lacks a dynamic dimension of the policy process and, as a result (2) fails to capture the interdependencies between networks. Ignoring these two aspects the PN ability to explain both the policy process and its outcomes is rather limited.

The Dynamic Dimension

PN literature has failed to capture the dynamic dimensions of elements in the policy process. It also has difficulties in capturing the modifications of interdependencies and actors relations along the process. Studies using the PN framework usually emphasize only one stage of the process. Many of them focus on the impact of PN on the tools selection stage (e.g. Saward 1992, Daugbjerg 1998, Gonzalez 1998,

Kitchen 2000, Howlett 2002), others on the implementation stage (e.g. Brinkerhoff 1996), and few on the problem analysis stage (e.g. Starik and Heuer 2002). But none of these studies look at the policymaking process through all its stages. As a result, some very important process' contextual aspects are neglected.

As noted by the Policy Cycle advocates, different actors participate in the different stages. Therefore it would be only logical to assume that the participating actors weave different alliances, cooperation practices and networks in each stage, according to their power positions, resources availability and interests. As a result, along the same policy process we should distinguish between several networks operating in different stages. Nonetheless, different networks do not necessarily suggest different composition of actors, but rather hint to variations in, for example, inter-actor relations, power delegation, resource allocation, and information flow. Hence, I argue that policy analysis, as well as policy theory, should pay attention to the dynamic dimension of the policy networks along the policy process.

Networks Interdependencies

Policies are shaped in a variety of coexisting multiple institutional-cultural-economical contexts that have a great influence on networks characteristics and thus on the networks effects on policy. Yet, scholars claim that one contextual aspect that is often neglected, and thus not well theoretically evaluated, is the multi co-existing networks that affect each other (Marsh 1998, Marsh and Smith 2000, Van Bueren et al. 2003), or in other words: networks interdependency. In a complex polity, argue Marsh and Smith (2000:8), the relationship between networks is clearly crucial. Hence, exploring these relations can explain some policy outcomes. But Marsh also points at the different networks that operate within the same policy process, influencing one another (Marsh 1998). He claims that it is possible that actors who are involved in the policy tools selection networks are not necessary involved in the implementation networks and that this can explain some implementation gaps (Marsh 1998:192). Following Marsh's notion regarding network-network relations within the same policy process, I argue that in order to explain and understand policies, as well as to design policy effectively, all the networks involved within the same policy formulation process should be considered. Due to the evolving manner of policy formation process, in which the process can move backward and forward, it is important to examine the network-network interdependencies.

Policy Process Networks

Consequently, I suggest the Policy Process Networks (PPN) perspective for policy analysis to tackle the abovementioned weaknesses in the PN framework. The PPN relies on the Policy Cycle notions that (1) different actors may participate in different policy stages, (2) different sort of activities and expertise are required in each stage, and that (3) each stage's outcomes affect other stages. From the PN literature it adopts the notions that (1) policies are shaped by networks of state and non-state actors, (2) networks should be examined in their contexts, and that (3) policy outcomes can be explained by network characteristics. From the Systems thinking it adopts the ideas of (1) dynamic processes, and (2) interdependency.

Networks dramatically vary along the policy formation process. It is not only that some actors participate in some stages while abstaining from other, but also that actors who have a great influence on a specific stage network, have a minor influence on another stage network (see for example: Perkin and Court 2005). Thus, the PPN perspective suggests understanding policy formation by considering all the different networks that participate along the process. While it enables us to look at the process through separate stages it also provides a better understanding of the policy as a whole.

PPN Methodology for Policy Analysis

The application of a PPN framework also demands a new methodology, which enables analysing the policy formation as an ongoing, dynamic, interdependent and in context process. A methodology that enables us in a systematic manner to observe the various networks operating in the same policy process, to understand the relations between these networks and to connect between networks and outcomes.

I suggest the following methodology. Its steps are the following: First, the policy process is broken down to its sequence stage (i.e. agenda setting, problem definition, problem analysis, policy tools selection, implementation, enforcement and evaluation). Second for each policy stage (1) the essential resources are identified (2) the set of outcomes is detected (3) the network is identified and examined (4) the outcomes are explained by the unique stage's network characteristics, and (5) the network characteristics are viewed and explained in the context of the other stages networks.

PPN analysis results in a detailed, structured, and in-context analysis, which emphasises the dynamic aspects of networks along the process. Multiple memberships in networks, variations in inter-actor relations and changes in flow of information patterns may shed light on some unnoticed aspects of the policy process. Furthermore, PPN analysis enables to detect more accurately weaknesses and strengths in the process, which in turn may contribute to designing policies more effectively. The following demonstrates the PPN usefulness as a policy analysis tool.

A Case Study: PPN and the Israeli Industrial Emission Policy

Like most developed countries Israel has legislation that defines the maximum level of pollutants, which are allowed in the outside air (*Ambient Air Quality Standards*). Usually, a complementary regulation for air quality is provided by the *Emission Standards*, which establish the maximum amounts of pollution that a given source is permitted to emit.

The Israeli Ambient Air Standards are aligned with the World Health Organization recommendations. But these air standards are not accompanied with legislation that controls emissions to the air. Instead, a voluntary agreement (the Treaty) exists, which controls only emissions from industrial sources. The Treaty was signed in 1998 between the Israeli Ministry of the Environment (ME) and the Manufacturers Association of Israel (MAI), which is the industrialists' umbrella organization.¹ The Treaty adopts German and European Union industrial emission standards. Since it was issued, most of the Israeli major polluting businesses have signed the Treaty. And yet, despite the Treaty, some of the ambient standards are exceeded almost daily. One reason for this is that businesses that signed the Treaty often violate it (Parag 2005).

Simple PN analysis would presumably focus on the ME and MAI strong cooperation and would explain air quality in Israel by the governance of such an alliance. Yet, focusing on the ME and MAI network in the national context per-se provides an incomplete picture and fails to explain why the Israeli air emissions policy was formulated as it was and why the Treaty does not seem to be the 'end point' of the process. A PPN analysis, which considers the dynamic dimension of the policy process and network-network context, reveals, for example, that the relations between the ME and the MAI vary in the different stages. The following sections use the PPN methodology for analysing this case². Findings are summarized in a table in Annex 1.

¹The Israeli Industrial Emission Treaty:

http://www.sviva.gov.il/Environment/Static/Binaries/Articals/0052_0.pdf

² The following case study is based on a variety of data sources collected in Israel between the years 2000 and 2004: semi-structured interviews, publications, environmental conferences, parliamentary committees' protocols, and official archives.

Agenda setting

In order to promote the problem of air pollution and its related health effects pro-environmental actors cooperate among themselves. The ME and some Environmental Non Governmental Organizations (ENGOS) are the most active actors in the agenda setting stage. An ongoing information flow exists between them. They support one another in activities that promote social and governmental awareness to the air pollution problem. One example for this cooperation is the joint seminars they conduct to various audiences about bad air quality and its effect on human health. These actors also support the formation and maintenance of local environmental grassroots organizations: the ME provides some money and the ENGOS information and 'know how'. Severe pollution events that catch the media attention are picked up by the ME and ENGOS and are used as a lever to increase public and local authorities support for reducing air pollution.

As another example for such cooperation, The Israel Union for Environmental Defence (IUED), one of the leading Israeli ENGOS, with support of the ME published a comprehensive report on the health damages and their related economic costs caused by air pollution in Israel. This report³ suggests that more than a thousand people die in Israel every year due to air pollution. Using public relations and lobbyists, the ME and the IUED promoted this report in the media and in the government. The figures presented gained high attention in the public discourse resulting in a number of the Parliament's Interior and Environmental Committee meetings that were dedicated to this topic and that called the government to act to reduce air pollution.

By sharing information and cooperating with each other the ME and the ENGOS succeeded in raising the profile of the air pollution problem in the national agenda. The need for further air pollution reduction and the absence of mandatory regulation that control air emissions was discussed in the media, in local authorities and in the parliament.

Problem Definition and Analysis

In the policy definition and analysis stage the network is restricted to those actors who present studies regarding cost-benefit, risk, and health analysis. The participants in the network are several ministries and the ENGOS. Although all the actors agree that pollution damages health they present different ways to measure the related costs.

The IUED and the ME presented together an analysis related to the health damages and its associated economic costs. They also presented an analysis, which focuses on the monetary benefits that industrialists gain from not implementing technical solutions for pollution reduction (Tal 2002). Industry, on the other hand, provided its own calculations of economic costs, emphasizing the huge investments required which would prevent it from competing in the global market and eventually would result in loss of jobs and an increase in unemployment. At the same time, together with the ME, the industrialists presented the fact that most of the air pollution comes from power plants and transportation. Therefore they both claim that any air pollution reduction policy should consider all sources and not only the industrial ones.

The Ministry of Infrastructures is another actor in this network – a dominant one. This Ministry decides on the grade quality of the oil Israel purchases. The better the oil grade, the less pollution it produces. It is also the Ministry in charge of Israel's Electricity Company. It is no surprise, then, that in its analysis this Ministry underlines only the costs of emission reduction and its effects on the economy. This sort of analysis was supported by the Ministry of Transportation that emphasised the anticipated increase of fuels rates, which in turn will result in an increase of cost of goods. Both of these ministries claimed in the decision making forums that the related extra costs would eventually be paid by the public.

³ A Comparative Assessment of Air Pollution Public Health Risks in Two Israeli Metropolitan Areas.
http://iued.org.il/text_item.aspx?tid=86&menu=7

Unlike the agenda setting network, in this stage network the ME is a relatively weak actor, compared to the other Ministries. The information flow and data sharing between the ME and ENGOs, and even between the ME and the MAI, is not enough. With no strong analytical support from the Ministry of Health, decision makers are provided with health damages' analysis originating from the ENGOs and with economic analysis presented by strong Ministries who predict an increase in consumer goods cost.

Tools Selection

The first policy tool the ME turned to was overall emission legislation. However, the power distribution within the tools network made legislation impossible. The dominance of economic considerations, the power of the Ministry of Infrastructure and the Ministry of Transportation, which were backed by the Ministry of Finance, versus the low priority of public health issues and the ME's political weakness were all demonstrated when the ME tried, and failed, to pass the regulation in the Israeli Parliament. Accordingly, the ME tried to overcome its relative weak position in the network by avoiding confrontation with strong actors and by turning to an alternative strategy – a strategy that places it in a relatively strong power position. Fragmenting the problem to its different sources (industry, transportation and power plants) was the first decision the ME took. Cooperating initially with the group that has an interest in controlling emissions was the second.

The industry has interests in an arrangement that sets emissions standards because otherwise the ME may use its only available tool to reduce polluting emissions – *The Business Regulation Act (1968)*. According to this Act the Ministry's inspectors can refuse to approve business' license if it does not reduce its emissions. Yet, this tool was not designed to control emissions in the first place and therefore has many limitations in doing so (Keret 2004). The MAI claims that the standards set in the licensing procedure are unsystematic and may change unpredictably from one year to the next. This inconsistency, in turn, increases uncertainty regarding required investments and impedes the industrialists' ability to plan for the future.

Sharing the same goal – establishing emission standards – although with different motivations, the MAI together with the ME looked for an alternative policy tool for controlling emissions. A tool that will not require any powerful Ministry agreement and that could be applied within a reasonable timescale. Together they decided to adopt an arrangement existing in the Netherlands – a Voluntary Treaty. To this Treaty framework they incorporated German and EU industrial emission standards. Upon voluntary joining the Treaty these standards are incorporated into the business license issued by the ME. This results in the business legal obligation to conform to the Treaty requirements. Among the obligations are the requirements to implement a self-monitoring procedure and to report the results to the ME. A Joint Implementation Committee was established to resolve disagreement and to update standards. Both sides are members in the committee but the Ministry holds the majority.

The industrialists' willingness to cooperate can be explained, as mentioned above, by the need for certainty. But cooperation with the regulator also provides them with exclusive access to the decision-making forums and with participation in constructing the policy tool so that it better suits their own interests. From the Ministry's point of view, signing this voluntary Treaty was a step forward toward the goal of reducing air pollution.

Few large ENGOs, which in previous stages cooperated with the ME, confront it this stage. They claim that the Treaty violates the rule of law, since as a voluntary agreement it is based upon industry's preferences, and such polluters lack an incentive to create strict standards. In addition, they claim, the public – which is affected by this arrangement – has no access and no say in the process (Karo Yefet and Papay 2001).

Accordingly, the IUED appealed to the Supreme Court against the ME claiming that all emissions to the air should be regulated by legislation.⁴ The IUED, has drafted a *Clean Air* bill and is lobbying for its acceptance in the Israeli Parliament.⁵ In many senses, the IUED is attempting what the ME failed to do. The ME cooperation with the MAI can be considered as an alternative exclusive network that shape the tool and in which the Ministry is dominant. Yet, as part of the agreed cooperation, some important actors are excluded from this alternative network. For example ENGOs, public representatives and independent experts are not allowed to participate in the Implementation Committee, which revises the Treaty on an ongoing basis. As a result, the representation of civil society interests is insufficient. At the same time, it should be noted that the Treaty as a strategy enables the ME to tackle the industrial emissions problem with limited resources by cooperating with industry instead of confronting it.

Implementation and Enforcement

The policy formation process does not end when policy tools have been chosen. The success of the chosen policy is an outcome of proper implementation and enforcement.

As of January 2005, out of about 1700 enterprises members in the MAI only 150 signed the Treaty. Most of these 150 enterprises used to be major polluters and have subsequently dramatically reduced their emissions. Yet, despite the significant reduction, random checks that the ME carried out consistently show that many of the enterprises examined were exceeding the standards set by the Treaty.⁶ Moreover, the self-monitoring emission results provided by the enterprises themselves differ dramatically from the random check done by the Ministry.

The abovementioned Implementation Committee governs and support implementation. Yet, unlike the previous networks, where the industry was represented by the MAI in the negotiations with the ME, in the implementation stage the network is much wider and more complex. It involves various businesses, which are not necessary willing to cooperate with the ME like the MAI did. These businesses, with only advisory support of the MAI have to implement the new standards into their manufacturing processes. They are required to search for new technologies that will enable them to reduce and monitor emissions. However, they have to do it with no financial support from the Government.

Whatever the reasons are for the poor implementation, it is obvious that no deterring enforcement mechanism exists. Although the ME publishes its random checks results, which show that many businesses emit more than allowed, since the introduction of the Treaty and up till 2004, the ME issued only two indictments against offending enterprises (Keret 2004). Instead, the ME prefers to negotiate with the offenders and to settle things out of court (Parag 2005). Eventually, polluting pays off because no real economic incentives are used to prevent poor performances. But by avoiding the court and by negotiation with each business, the ME also decreases transparency in the enforcement.

Israeli ENGOs usually hold a key role in implementation and enforcement of environmental policies (Weinthal and Parag 2003). But the Treaty limits their ability to participate in both the implementation and the enforcement networks. Since the Treaty is voluntary ENGOs do not have legal standing to appeal to the courts against offenders (Keret 2004). Since no legal action is taken against offenders by ENGOs or the ME, the Judiciary's role in the industrial emission policy process, which could have been significant, is marginal.

Evaluation

Both actors who manage the Treaty evaluate it as successful and want to maintain it. When the Treaty was introduced in 1998, the ME considered it only as an intermediate arrangement on the way to legislation. However, as time passed the Ministry changed its mind and has not done any effort to

⁴ No verdict yet.

⁵ IUED website <http://www.yarok.org.il/> (IUED presenting the bill for Israel's Clean Air Act 2002, 27.05.02).

⁶ In 2001 41% of the enterprises examined exceeded the standards, in 2002 60%, and in 2003 58%.

promote an overall legislation in the Parliament. The ME claims that thanks to the Treaty, industrial emissions to the air were significantly reduced. In addition, it argues that due to the disagreement of other powerful Ministries - in other words, the power distribution in the tools selection network – any attempt to promote a bill for overall emission control would take few years and in the end of the process the ME would be forced to agree on a relatively low standards. Instead of legislation, which means confrontation in a network in which it has a weak position, the ME is now negotiating directly with the Electricity Company – another major polluter - and wishes to introduce one more voluntary agreement based on cooperation for emissions reduction.

The MAI considers the Treaty as a successful arrangement because by being a powerful actor in the alternative tools selection network it enables businesses to slowly adjust to emission reductions. Furthermore, taking into consideration the enforcement network which does not present any deterring punishment to offenders, MAI members are not threatened by heavy penalties. Hence, MAI and the ME both protect the Treaty.

ENGOS, on the other hand, evaluate the Treaty's success by comparing it to the hypothetical situation where all emissions are controlled by legislation. Using the mass media and Parliamentary lobbyists they are demanding the ME to confront other Ministries in the original tools network and not to give up. Using public relations and media coverage, their policy evaluation in many senses is tightly linked to the agenda setting network.

Summary and Conclusions

This paper followed the logic of soft system thinking that calls for investigation of complex phenomena, such as policy formation processes, in their contexts and while considering the relations between different elements composing and effecting the phenomena. It was argued and demonstrated here that the same policy process is actually governed by different PPN, which operate one in the context of the other, influencing one another. Breaking down the process to its stages while considering the context reveals few previously unnoticed important insights and explanations regarding who shape the emission policy, how and why. By emphasizing the dynamic aspect of the process and the networks interdependencies, PPN enables better detection of strengths and weaknesses of the process, which in turn may lead to policy capacity improvement and to an effective change.

The analysis uncovers some constrains, which hinder problem solving and impede decision-making. More specifically, it points at the weaknesses of implementation and enforcement networks. The Israeli ME needs to rethink both networks - in terms of structure, participation rules, power distribution and resource distribution - in order to improve these stages outcomes and to enhance the policy effectiveness.

In general decision makers may find PPN perspective useful when thinking about new policy or policy alternation. Detecting and taking into account the multiple actors and interests, the possible linkages and interdependencies between the stages' networks, and the constrains that one stage's outcomes pose on the following may help to avoid some future policy failures.

PN framework is often criticized as lacking a theoretical ability to predict outcomes and explain policy transformation (Dowding 1995). Yet, adding system thinking ideas and studying policy making from the PPN perspective point to a new aspect of networks to theorize upon: the relation between the different networks governing the same process. Elements such as multiple memberships in different PPN or the dynamics of confrontation versus cooperation along the process may hold the potential to explain policy change and to contribute to PN theory.

Annex 1: Policy Process Networks analysis in the case of the Israeli air emission policy

Policy Stage	Networks members	Networks characteristics	Essential resources	ME position in the network	Stage outcomes
<i>Agenda Setting</i>	ME, ENGOS, Parliament committee, local authorities.	Open network. Strong cooperation between the ME and ENGOS.	Information, media attention, public awareness.	Leading and dominant actor.	The air pollution problem entered the headlines and was discussed in several Parliament committees more than 5 times.
<i>Problem Definition and Analysis</i>	Health, risk, and economic experts, Ministries of Environment, Infrastructure, Finance, MAI.	Restricted participation, dominance of economic consideration. Cooperation between the ME and the MAI and in the same time between the ME and ENGOS.	Analytical expertises, access to information, political power.	Weak actor in a network dominated by economic considerations.	The problem was framed and analyzed by most actors mainly in its economic aspect. Health aspects were promoted by ENGOS and not by the Ministry of Health.
<i>Policy Tools Selection</i>	The weakness of the ME in the Government brings it to form alternative network with the MAI.	In the alternative network the ME is a strong and leading actor. It is a close and very restricted network.	Technical expertise. Access to the decision-making forum.	Weak actor in the cabinet network. Strong actor in the alternative network.	A voluntary Treaty is the selected tool, which controls only emission from industry. This tool does not refer to the health analysis but rather to the economic one.
<i>Implementation</i>	ME, MAI, business that signed the Treaty.	Network with many participants from different business. Its members do not necessarily fully adhere to the MAI and ME cooperation. Information flow is not reliable.	Financial resources, technical expertise, know how.	Weak actor in a multi actor's network, in which many members not fulfilling the agreement.	About 150 businesses signed the Treat. They have to implement it with no support from the ME or the government. Implementation can be measured in terms of how many businesses sign the Treaty and how many reduced emissions.
<i>Enforcement</i>	ME, Courts. ENGOS have no access.	The ME is the 'gate keeper' of this network. It tends not to involve courts but rather to negotiate with the polluters.	Financial resources (inspection), deterrence, access to data, law expertise.	Poor in enforcement resources and thus relatively weak actor that promote cooperation over confrontation with polluters.	The enforcement mechanism is weak. Despite the fact that many businesses exceed their permits, no deterring penalties mechanism exists. The ME prefers negotiating with offenders instead of punish them. Courts are hardly ever involved.
<i>Evaluation</i>	ME, MAI, ENGOS.	Network that includes the ME and the MAI, but is challenged by ENGOS. Closely related to the agenda setting stage.	Data, information, alternative solutions.	A dominant actor, who supports the current tool, and does not want to change it.	The Treaty is evaluated as successful tool to reduced emission by both MAI and the ME. The policy solves only one aspect of the problem.

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