

Energy distribution system operator in interaction with social actors: three cases

Bauke Steenhuisen¹, Wijnand Veeneman², Leen van Doorn³, Harry van Breen⁴

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Abstract

A publicly owned Dutch energy distribution system operator (DSO) interacts during local infrastructure projects with its direct stakeholders to maximize utility in the public interest. These projects are about replacing, relocating, removing or reconstructing parts of the gas and electricity networks. At the same time, this DSO is heavily regulated since the market reforms, although it remained public, but because it remained a monopoly. This regulation forces the DSO to yearly increase its efficiency and production. These two ambitions – made-to-measure projects and yearly more efficiency – increase pressure on the DSO and its interactions to arrange for trade-offs. The authors describe how this pressure works out in day-to-day interactions between a DSO and its social environment, its many stakeholders. The empirical question of this paper is how the interaction between a DSO and its stakeholders is currently organized and how this works out for concrete infrastructure projects. The current context of increasingly multilateral, commercial, fragmented and connected energy systems, triggers, and at the same time hinders, great ambitions to design and develop energy systems in more interactive, democratic ways. In this paper, a DSO aspires to make its direct stakeholders essentially leading in the design and development of energy systems. Realizing this ambition ultimately boils down to the operational capacity of a DSO to have lively and flexible interaction with its stakeholders on sensible trade-offs for concrete infrastructure projects. The operational capacity to interact has been studied in three cases. The first is about a DSO interacting with municipalities to fit urban development plans aboveground with the energy networks underground. Note: In the Netherlands, nearly all energy distribution networks are buried underground. The second case is about a DSO interacting with water boards about the safety risks of current networks buried in dykes. The third case is about a DSO systematically evaluating a diverse portfolio of projects by inquiring customers in order to increase their satisfaction for future projects. For these three cases, we observe in detail how the organizational ambition to increase efficiency thins out the social interaction to arrange for thoughtful trade-offs of different actors that adhere different value systems. The conclusion provides a new perspective on possibilities and limitations of DSO's to organize forms of interaction with their stakeholders under the current conditions.

¹ Assistant professor, Faculty of Technology Policy & Management, Delft University of Technology

² Associate professor, Faculty of Technology Policy & Management, Delft University of Technology

³ Alliander

⁴ Alliander

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Introduction

This paper reports on how a Dutch energy network distribution company interacts with stakeholders in the decision making and execution of infrastructure projects. A multitude of external stakeholders can be involved having many different roles (Moore & Khagram 2004). In the Netherlands, these stakeholders can be subdivided in those related to the energy value chain (customers, energy producers, energy transport companies, energy sellers), those related to the space occupied by the infrastructure (local population and traffic, governmental agencies, water boards, project developers), those regulatory related to the sector (safety regulators, market regulators, law enforcement), and many more.

These stakeholders purport a variety of values, related to their role and personality or culture. The social performance of an organization operating in such a context, depends on how well its personnel, actions and products support these values. These stakeholder value systems are generally neither well-articulated nor stable (De Bruijn & Dicke 2006, Veeneman *et al.* 2009). In addition, the organization has to deal with possible trade-offs between the different values of different actors in the daily reality of performing infrastructure projects.

Applying stakeholder value systems with many infrastructure development projects has additional complications. A project is in its essence less tightly coupled to the organization as a whole and is directly aimed at action, directly influencing other stakeholders. This essentially requires companies to be guided by a constant, iterative, multi-actor process of defining and re-defining the values at hand and the trade-offs required for specific actions, products and projects. Multi-actor processes, however, generally destabilize favourable project conditions (De Bruijn & Ten Heuvelhof 2010). And these multi-actor processes only tend to become more and more messy in the emerging contexts of multi-lateral, fragmented and interconnected energy systems (Graham & Marvin 2001). This paper confronts this multi-actor perspective on realizing public value with the current practices of a Dutch energy distribution company interacting with its stakeholders in the daily performance of infrastructure projects.

The context of recent liberalization of the Dutch energy sector is also important here. EU member states redesigned their energy sector in line with European guidelines. Production and energy supply have been liberalized, partly privatized and re-regulated (Ten Heuvelhof *et al.* 2010). Accordingly, many new organizations and institutions have emerged, and many old faded away. Since the European energy sector has gone through radical restructuring, in the past fifteen years, the interaction between energy companies and their social environment has undergone a metamorphosis. Energy companies went from being a part of a wider governmental organization with

⁵ Assistant professor, Faculty of Technology Policy & Management, Delft University of Technology

⁶ Associate professor, Faculty of Technology Policy & Management, Delft University of Technology

⁷ Alliander

⁸ Alliander

claims of societal representation and control, to being private parties with their own interactions with outside, often wary, stakeholders.

These changes did not go by unnoticed. They inspired fierce and constant public and political debates on the performance, safety and reliability of these new energy sectors. New public oversight bodies, the media, politicians, local governmental institutions, customers and the direct social environment now increasingly interfere and, simply put, they increasingly tell energy companies what they do, or did, wrong. Dicke, Steenhuisen and Veeneman (2011) describe this development as a 'mobilization of functional distrust' and argue it has the potential to help the energy sector when there is a need to trade-off public values, values that we expect public agencies to secure. This potential, however, is not self-fulfilling. There are at least three major obstacles. First of all, public values are essentially relative, contested and dynamic and, thus, not a most convenient guidance (De Bruijn & Dicke 2006). Second, the energy company is operating on the public-private edge, with a clear contrast between the stakeholder driven value orientation (with a wide set of values and complex trade-offs driving decisions for the long term) and a shareholder driven value orientation (with the bottom line as mono-value driving decisions for the shorter term). A third obstacle is that the new energy companies are not really new. They are old state monopolies in a new environment. Most energy companies inherited an organizational structure and culture generally dominated by bureaucratic principles, and even more so as energy companies increased in size after merging.

One of these new organizations is distribution system operator (DSO) Liander, part of Dutch energy grid company Alliander, and formerly part of the integrated multi-utility Nuon. Liander is a publicly owned DSO connecting respectively 2,1 million customers to its gas and 2,9 million customers to its electricity grid. In the Netherlands, electricity and gas grids are largely buried down till one metre below ground level. Liander constantly performs projects to replace, relocate, remove and reconstruct parts of the gas and electricity networks. A DSO is a regulated monopoly, because it is impossible for customers to choose between different energy grids. DSO's are regulated on predefined products and are given regulatory incentives to reduce cost and increase reliability. Liander nevertheless articulated the explicit ambition, on top of this heavy regulation, to increase the influence of stakeholders on their daily actions, products and projects for many specific trade-offs.

This ambition has become increasingly urgent since the restructuring of the energy sector. The old, local relationships between DSO and customers have disappeared in the eighties and nineties of the twentieth century, as many small DSO's merged into a few large energy companies. Liander wants to guarantee that their daily trade-offs are the result of what their stakeholders together want. Note that this ambition essentially exceeds the well-known triple-P approach that urges organizations to take into account people, planet and profit. Above *taking* corporate social responsibility, Liander prefers to *give* responsibility *back* to its social environment, to let stakeholders arrange the trade-offs. The presumption is that this strategy change enables the DSO to fully align its process with the values in its environment.

This paper is an empirical exploration of what this ambition, and the advanced interaction with stakeholders it requires, means in the daily practice of performing infrastructure projects. These interactions often bring along conflicts that gradually get more and more complex as more stakeholders get involved. Here is an example. Asset managers at Liander daily analyse the cost-effectiveness of taking measures against leaking gas pipes. These asset managers systematically evaluate risks on the basis of transparent criteria and weights. They use a risk matrix for each and every decision. A risk matrix based on the values of the organization's stakeholders, see Figure 1 and Figure 2.

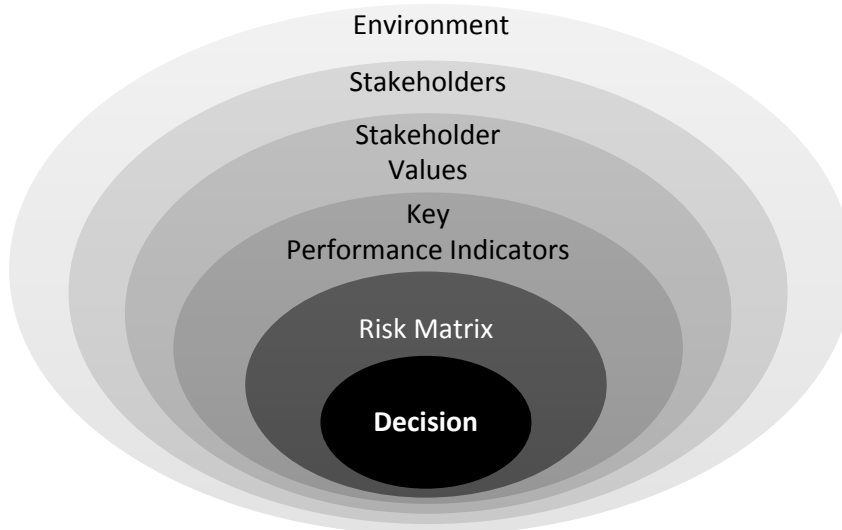


Figure 1: The risk matrix as a representation of the environment (Van Breen & Janssen 2008)

Category	Effect			Chance							
	Financial	Reliability	Safety	<0,001 x per year	0,001-0,01 x per year	0,01-0,1 x per year	0,1-1 per year	1-10 x per year	10-100 x per year	100-1000 x per year	> 1000 x per year
Minor	< 10 k€	< 10 k (lost) minutes	Small injury	Green	Green	Green	Green	Green	Green	Green	Yellow
Moderate	10-100 k€	10 – 100 k minutes	< 3 days sick leave	Green	Green	Green	Green	Green	Yellow	Yellow	Red
Serious	0,1-1 M€	0,1-1 M minutes	> 3 days sick leave	Green	Green	Green	Yellow	Yellow	Red	Red	Red
Severe	1-10 M€	1-10 M minutes	Casualty/ handicap	Green	Yellow	Yellow	Red	Red	Red	Red	Red
Catastrophic	>10 M€	> 10 M minutes	Multiple casualties	Yellow	Red	Red	Red	Red	Red	Red	Red

Figure 2: A simplified version of the risk matrix (Van Breen *et al.* 2009)

In this example, an asset manager balances costs, reliability and safety and decides to renew an old gas pipe for safety reasons in the middle of Amsterdam. Later, a project manager at Liander starts up this project and contacts the stakeholders to plan for the renewal. The project manager encounters unexpected opposition, discovers new stakeholder values and uncovers hidden conflict. Local shopkeepers and citizens, whose safety is at stake according to the risk analysis, oppose the project for other reasons. In their view, the amount of construction work has recently been out of all proportion in their area. The municipality agrees with its citizens and shopkeepers and refuses to grant a permit for the project. There are feasible alternative routes for the gas pipe, but these alternatives will cost significantly more. So, whereas the asset manager established a well-balanced trade-off, the actual interaction with local stakeholders forces the project manager to unexpectedly re-open that trade-off in a complex, and sometimes plainly hostile, field of influences. The wider context of reality rebalanced what is to be considered desirable as trade-off.

By means of three exploratory case studies, this paper analyses how the organization currently performs infrastructure projects in interaction with stakeholders. Each case description is

based on ten interviews with key respondents. First, we sketch a framework that links stakeholder engagement with organizational conflict literature to interpret the cases. Confronting the ambitions of Alliander with current practices of interactive decision-making, leads to down-to-earth findings. Interaction with stakeholders appears discouraging and bulky when it comes to supporting an organization in making complex trade-offs.

Theory: Organizational conflict and stakeholder engagement

Previous research has shown that operational organizations in a fragmented environment with many different stakeholders implicitly absorb the inconsistent demands of their environment. This has been described as the 'multiple principal problem' (Waterman and Meijer 1998). Steenhuisen (2009) concluded that operational organizations, the 'agents', neglect to recognize this problem. As a result, inconsistencies transform into organizational friction and trade-offs emerge, instead of being arranged by deliberate design. In this line of analysis, operational organizations cope with conflicting demands of their stakeholders and the wider environment, but in an oblique way.

Operational organizations retain a constant state of organizational conflict, as conflicts are not recognized and solved directly. Instead, a constant friction settles between the planning and the operation stage within these organizations. Organizational members in both these stages are simultaneously coping with conflicting demands, but in radically different ways (see also Steenhuisen & Van Eeten 2012). In the planning stage, the dominant coping strategy is to realize values one by one. Each value brought forward by different stakeholders is operationalized separately and safeguarded in single value norms, risk analyses, plans, budgets, key performance indicators and procedures. The rational is to protect values against conflicts. In the operation stage, single value perspectives are a scarce luxury. Operational processes constantly force organizations to simultaneously comply with multiple norms and multiple plans for multiple values. Operation deals with multiple specific situations, where policy is written based on the average or representative situation. On a daily basis, unplanned conflicts emerge and require trade-offs and structural violation of the safeguards initiated in the planning stage. This may evolve in routine nonconformity, as Vaughan (1999) describes. What Steenhuisen (2009) also found was that this combination of relatively dissociated coping strategies –in the planning stage and the operational stage – is not necessarily dysfunctional. Well-organized 'loose couplings' between single value safeguards in the planning stage, on one hand, and the multi-value improvisations in the operation stage, on the other hand, may enable organizations to counterbalance both the violated safeguards and chaotic improvisations (Orton and Weick 1990).

This paper takes this conceptualization of organizational conflict as a starting point. A next step is to confront this organizational 'coping' perspective with the context of interacting with stakeholders at multiple stages and levels during the life cycle of infrastructure projects.

Basic concepts from stakeholder engagement literature are useful to describe how these organizational tensions and coping strategies combine with interactive decision-making. We identified four general dimensions relevant to describe how this interaction takes place: the cause of interaction, the interaction strategies, the underlying relation and the process of interaction. Svendsen (1998) names a series of causes that trigger stakeholder interaction ranging from necessity to voluntary and from risk to opportunity. With regard to interaction strategies, there is a recurring dichotomy between *managing* the influence of stakeholders to buffer the organization against conflicts and *enabling* stakeholders to safeguard interests by bridging organizational barriers for them

(Harrison & St John 1996, Freeman & McVea 2001, Parker & Selsky 2004). The ambition of Liander, described above, clearly fits the second strategy type. These two strategy types roughly correspond with a similar dichotomy in relation types. Buffering the organization against conflicts by managing stakeholders tends to go together with an opportunistic, volatile relation. Bridging organizational barriers, enabling stakeholders to safeguard interests generally implies a more institutionalized relation with a structural role for stakeholders in the organizational processes. Parker and Selsky (2004) use another similar dichotomy opposing common culture to emergent culture relationships. These cultures have major implications for the related process of interaction. A *common culture* relationship implies predictable and stable rules and routines to guide the interaction process. An *emergent culture*, by contrast, actively shapes new rules and routines within the process.

Through this stakeholder engagement literature shimmers a framework to describe and conceptualize interactions (see Figure 3). Across the different dimensions of interaction (causes, strategies, relations, processes), we sketch two ideal types of stakeholder interaction in relation to organizational conflict. In type 1, the rational of interaction is to minimize organizational conflict. The rational of type 2, by contrast, is to constantly absorb new conflicts. There is an evident relation between the coping strategies found in the planning stage and the operational stage, described above, and respectively type 1 and type 2 in this framework. In a way, type 1 represents the ‘old world’ in which planning strategies are able to buffer the inconsistent demands between stakeholders. To actually engage in stakeholder interaction to arrange trade-offs is a burden, a risk and only done when necessary. Type 2 represents the promise of stakeholder engagement and expresses trust in the capacity of an organization to cope with conflicts. The idea is that stakeholder engagement improves performance, since only by constantly responding to the actual demands of stakeholder an organization can align its processes.

Both types of interaction can be functional and dysfunctional. Both types require balancing as well. It can be functional to plan for conflict free operations, though it restricts operational responsiveness to stakeholders. It can also help to be fundamentally open to all kind of conflicting stakeholder interests, but this may deteriorate the coordination degree of an organization.

We use these ideal types as reference for describing three real-life cases of interaction between Liander and its stakeholders when realizing infrastructure projects. The framework forms a starting point to make sense of how to balance the functionalities and dysfunctionalities of interactive decision-making.

	Type 1	Type 2
Cause	Necessary Risk	Voluntary Prospect
Strategy	Managing stakeholders Buffering	Enabling stakeholders Bridging
Relation	Opportunistic	Structural
Process	Common culture Strict conditions	Emergent culture Flexible conditions
Attitude	<i>Conflict-averse</i>	<i>Conflict-seeking</i>
Coping	<i>Mono-value safeguards</i>	<i>Multi-value improvisations</i>

Figure 3: Dimensions of interactive decision-making with stakeholders, and two ideal types

Method: Tracing how interaction influences trade-offs

The case-studies are about common types of infrastructure projects that require interactive decision-making between a DSO and its stakeholders. We look at a variety of projects that involve one or a few stakeholders. We did not look at highly unique and complex projects. Within each type of interaction, we focused on the core operational process of planning and realizing projects. We further zoomed in on the competing public values and how interaction influences trade-offs among them.

We started with respondents in the planning stage highly involved and partly responsible for the projects we aimed to study. Conversations with these key respondents were no real interviews yet but resulted in an alliance to study the questions we pose in this research paper. To further unravel how interactive decision-making currently works for a DSO and its stakeholders, we were introduced to new respondents who realized projects and interacted with stakeholders in the planning and operational stage. We kept meeting new respondents down and up the line of managers, or working at staff departments, until we gained a full understanding of the whole interaction process, from its causes to its consequences. We also conducted some interviews with the directly involved stakeholders to compare their perspective with the perspective of the DSO.

For three cases in total, we conducted sixteen interviews within and fifteen interviews outside the Liander organization. The interview protocols were semi-structured and evolved with our understanding. Conversations focused on describing the project with emphasis on the need for interaction, the actual interaction (with whom, when and how), the values relevant and the trade-offs emerging during interaction and, finally, the appreciation of the interaction by the participants.

All data was gathered in the period 2010-2011. Interpreting these interviews was partly done in cooperation with our respondents. During the interviews, respondents were selectively informed on the ideas of other respondents. Also, the sum of interview results was elaborately discussed with a variety of Liander employees at five official meetings. These discussions and reflections on the interviews added a significant angle to data interpretation.

Three cases of interactive-decision making

The three cases that were selected, are (a) relocating cables and pipes for municipalities because of urban development, (b) removing cables and pipes for water boards because of safety issues in dykes, and (c) increasing customer satisfaction for constructing, dismantling, extending, or reconstructing parts of the network at the customer's request. These cases represent common issues a grid operator faces. The first case (a) involves a repetitive issue. The second case (b) is a singular issue. The third case (c) is a continuous issue. The case selection allows us to study how various types of interaction affect public value trade-offs in a roughly similar project context. These interaction processes are concisely described below, including some observations and general reflections. In each case, we first describe the case in general and afterwards link our findings to the interaction framework (Figure 3).

Case 1: Relocating cables and pipes for municipalities because of urban development

The cause to interact is external in this case. That is stakeholders, not the DSO, start the interaction. Municipalities regularly perform urban development projects that requires the DSO to relocate parts of their network. Typical causes of these projects are constructing a roundabout, asphaltting a (cycle) road, renovating a flat, building a new residential area or reorganizing a public space.

The cost of typical reconstruction works are in the range from 10 to 100 thousand Euro. Who pays these costs, is a complicated matter. It highly differs per municipality, type and underlying reason of the reconstruction. Existing contracts defining cost allocation between parties involved may be decades old, made in a time where relationships between energy company and the municipality was significantly different. It may happen that similar projects are either fully paid by municipalities or fully paid by Liander, depending on the municipality that requests the DSO to relocate the networks.

In most projects, the simple fact that a cable or pipe needs to be relocated immediately brings along a complex trade-off for a range of imponderable public values: (i) spending public money efficiently, (ii) sharing costs fairly, (iii) maintaining the quality level of the grid, (iv) maintaining the safety level of the grid, (v) future robustness of the new network configuration, (vi) quality of urban development, and (vii) satisfaction of the stakeholders of the DSO in general. For example, it may be the case that tolerating a slight deviation of the rules prescribing for network quality, can save huge costs. How the DSO interprets their technical rules and procedures, may make or break the possibilities for urban designers to realize a financially feasible, high-quality public space. Next, municipalities may be very pleased when Liander pays for the relocations, but at the risk that this cost distribution incites municipalities to structurally underestimate the full costs of urban developments for society.

We focus on the interaction process that generally goes through the following steps:

1. The municipality informs DSO's on major urban developments in advance in bilateral relations or in multilateral platforms. This initial planning phase usually involves little detail and little discussion. Liander anticipates these developments in their yearly planning.
2. The municipality (being the client) concretizes an urban development project
3. As the plan gets more and more detailed, the client scans possible conflicts with underground networks. In the Netherlands an overview of all underground infrastructure may be obtained through an on-line service, called 'Klic'. Using this service is required prior to any construction work involving digging into public ground.⁹
4. If there is a conflict, the client informs Liander and invites offers.
5. Then, a project manager, within the operational department 'Aanleg' (Construction) in Liander, starts exploring.
6. The project manager meets the client and discusses the need to relocate.
7. At the end of this meeting, the project manager and the client usually agree on a standardized contract with reference to the (prevailing) regulation on cost distribution and a custom-made plan according to the technical rules of Liander.
8. Next, the project manager mails 'Asset management', a staff department in Liander, for financial approval.
9. The coordinator at Asset management, as a rule, approves since the budget for relocation has overall been sufficient through the years.
10. The project manager prepares the project and refines the drawings.
11. The project manager instructs contractors, starts the project and further acts as coordinator.
12. When the project is done, the department of the project manager sends the bill the client.
13. An account manager at 'Construction' takes care of any follow-up if needed

⁹ www.klic.nl

A first observation is that the amount of interaction, between the client and the DSO, is remarkably low, despite the complex trade-offs dealt with in these processes. Before the municipality invites offers, for example, the process does not anticipate a need for interaction to discuss the interdependencies between underground and aboveground infrastructure. A second observation is that the marginal interaction present fully takes place at the most operational level within Liander, namely in the department 'Aanleg' (Construction) with a project manager. The involvement of staff department 'Asset management', by e-mail, usually has virtually no effect on the process. A related, third observation is the apparent absence of organizational coordination between departments. The project managers act rather autonomously in the process. A fourth observation is that the major momentum to arrange a trade-off in the process, when agreeing on the contract, is highly standardized by technical and financial rules and regulations. These standards are, in principle, well-suited to protect various values against conflicts but provide little guidance, and often little room as well, for project managers when conflicts do occur. Except the rule of thumb 'to do what seems in the public interest', there is generally no overarching framework supporting project managers when discussing complex trade-offs in interaction with clients.

The dominant image in these observations is that projects are run, as if relocating cables and pipes was like a standard procedure, and as if it did not involve complex public value trade-offs. Interaction is organized as if the underlying challenge is a clear optimization problem from point of view of the DSO, relocating the underground cables and pipes at minimum costs, as if the best way to interact is to follow the procedures.

In our interviews, respondents at municipalities generally see much room for improvement in how these projects are run. It often happens that a municipality plans urban development projects without realizing the financial consequences of relocating cables and pipes. It often happens that specialistic knowledge of Liander on the possibilities and impossibilities to relocate energy networks does not reach the designers of urban development projects in time. Municipalities, and partly the DSO as well, suffer from 'terra incognita' as it was called by respondents. There can be many unknowns underground. And the interaction process is not organized to anticipate this knowledge gap. It also often happens that the municipality and Liander disagree on the contract, mostly on the costs and interpreting the regulation on cost distribution. Solving these disagreements at the level of project managers is hard. There are generally two ways out, and little in between. Project managers may either hold on to the standards, buffering Liander against complex trade-offs, or stick their neck out for the public interest by improvising around the formal conditions, engaging in obscure trade-offs that are hard to keep consistent and account for. Both approaches are vulnerable and prone to criticism. On the whole, the trade-offs in doing infrastructure projects structurally transform into this tough dilemma at the level of project managers.

Case 2: Removing cables and pipes for water boards because of safety issues in dykes

The cause of interaction in this second case is also external, but there is a difference. In this case, the public value is dyke safety. Cables and pipes in dykes have always been considered a risk, weakening the strength of the dyke. But this risk has been tolerated up to recently. Dykes have been used in this multi-functional way for as long as energy grids are buried underground. However, a new Dutch water law in 2010 combined with the development of merging water boards and increased dyke protection work, triggered water boards to prioritize this old risk of cables and pipes in dykes. Water boards

demanding grid companies to guarantee dyke safety. If not, their networks for water, energy or communication should be removed, as the permits would be withdrawn.

This case involves similar public values as in the previous case, plus some extra. The public values in the previous case were (i) spending public money efficiently, (ii) sharing costs fairly, (iii) maintaining the quality level of the grid, (iv) maintaining the safety level of the grid, (v) future robustness of the new network configuration, (vi) quality of urban development, and (vii) satisfaction of the stakeholders of the DSO in general. Additionally, other relevant public values are (viii) dyke safety, and (ix) the legal obligation to connect all users to the energy grid, also those living between the river and the dyke. The extra conflicts are evident. Liander is legally compelled to cross a dyke when they need to connect a house in between dykes, whereas a water board may deny the company a permit to do so. Another complex trade-off forms the costs. The high costs of removing and relocating all the cables and pipes in dykes can be unprecedented. Are the safety risks prevented actually worth the investments? Who is to judge and who is to pay? Who is to pay for whose risks?

The relative uniqueness of these projects and trade-offs, compared with the previous case, has implications for the process of interaction. Relations between water boards and utility companies are generally less institutionalized and less developed. These more exploratory, experimental interaction processes roughly developed through the following steps:

1. Water boards hint utility companies that their safety policies will change with regard to cables and pipes in dykes.
2. 'Asset management' at Liander does not take immediate action but thinks it over.
3. Water boards perform a regular inspection of the dykes and observe, as expected, that the cables and pipes in these dykes, they used to tolerate, do not comply their safety policies.
4. A project team on behalf of a water board, usually staffed by an engineering company, starts planning a dyke reconstruction, for reasons unrelated to the cables and pipes, and simultaneously informs Liander that this dyke reconstruction project will also be seized to make Liander remove their cables and pipes that will soon not be tolerated, unless they can guarantee and prove there is no risk for dyke safety. Liander is asked to cooperate.
5. A project manager at Liander joins the dyke reconstruction project. If the project becomes concrete enough, project manager start a relocation project as if it was on client's request.
6. Project managers signal that water boards soon may request many more relocation projects, more than Liander can handle. 'Asset management' is informed.
7. 'Asset management' approaches water boards at a strategic level to discuss their safety policies and the trade-offs they cause between dyke safety, costs and energy related public values.

From this point on, the process of interaction goes on at both the strategic and the operational level simultaneously. We are fully aware to have simplified the actual interaction, but this generic description already captures a number of significant observations. First of all, we see major similarities with the previous case. There is little interaction and the marginal interaction present starts at a low level. Moreover, these operational interactions appear completely insufficient to discuss the underlying trade-offs. At the level of a dyke reconstruction project, both parties lack guidance or room to reasonably balance dyke safety with costs and energy grid related public values.

Major difference with the previous case is that now both the operational and planning stage within Liander are involved. Conflicts, at first, are shifted to operation but soon prove too big to handle and immediately escalate to the upper managerial and staff levels again. Subsequently, 'Asset

management' tries to get involved but lacks a substantial existing relationship at the strategic level of water boards to discuss joint trade-offs. This results in a very slow, vulnerable process of establishing delicate relationships to discuss tough trade-offs. In the meanwhile, dyke reconstruction projects suffer delays and lack of guidance.

The dominant image is that both parties avoid, at first, the complex trade-off. It is rather evident that the public value trade-offs to remove a substantial amount of utility grids, require extensive interaction to map all the consequences for a variety of options. However, both parties neglect to anticipate the need for this extensive interaction. Initially, there is no deliberate strategy or policy at either side to make joint trade-offs, or support the other side in making risk analyses. As in the previous case, individual project managers are the first to bite the dust. They discover the conflicts and initially buffer the tensions, until these cannot reasonably be buffered any more.

Meanwhile, respondents at water boards experience utility companies as non-cooperative, reluctant and slow. Liander, in turn, does not appreciate water boards either. Respondents at Liander describe the demands of water boards as neither realistic nor socially responsible. In short, poorly anticipated interaction damages the mutual relationships, whereas the desirability of huge future trade-offs for society depend on the extent to which these relationships facilitate fruitful cooperation.

To accommodate the need for a functioning working relation between water boards and DSO's, an agreement is developed at the end of the period of this investigation. In this agreement, the interaction process to come to a joint decision will be described. The result will have to comply with the combined set of rules and regulation of both water boards and DSO's. In addition, guidelines for the actual decision to remove, relocate and/or let a cable or pipe remain will be incorporated. At the time of writing this paper, the discussion between the water boards and DSO's was not concluded yet.

Case 3: Increasing customer satisfaction in a diverse portfolio of projects

This third case of interaction contrasts with the previous two in several ways. Interaction is not externally driven in this case, as we focus on how Liander gains information on customer satisfaction in order to learn and adapt their operational processes accordingly. The interaction of this case is institutionalized in a 'customer contact evaluation' system. Performance information is generated on the level of individual projects for individual customers. Another difference with the previous cases is that, in this case, interaction is organized away from the operational stage of a project.

The ambition of the organization is to increase customer satisfaction up to an '8' (on a scale of 1 to 10) for a wide range of common infrastructure projects. This ambition leads Liander to actively seek interaction with its stakeholders. We focused on constructing, dismantling, extending and reconstructing parts of the network for households, companies or local governments.

These projects are individually not that significant for the organization. But these projects can be very significant for the customer, who waits for a connection to start business or needs to accept that Liander blocks the street for a few days or even upsets a rose garden in order to do the job. These projects often involve complex trade-offs like these. Public values are (i) customer satisfaction, (ii) quality and safety of the networks, (iii) safety of the maintenance work, (iv) cost efficiency for Liander, (v) efficiency for the customer, (vi) protection of the customer, and (vii) satisfaction of other stakeholders. What satisfies customers most (e.g. speed), is not always best for the network on the long term. What is efficient for the DSO (e.g. closing off a large area for a long time to do the construction work), may be highly inconvenient for the customer. Increasingly strict rules for safe

maintenance work can also have major impact on the costs of the project and the number of planned outages a customer and its neighbours may experience.

Like in the first case, these projects are heavily regulated for multiple public values and the interaction processes are also heavily institutionalized by standard procedures and contracts. The process of interaction, in relation to the performance information on customer satisfaction, generally involves the following steps.

1. The customer requests Liander to construct, dismantle, extend or replace the network.
2. A project manager performs the project in consultation with the customer
3. A staff department organizes an interview by phone with each customer after a project is finished. Customers are asked to give their appreciation of different aspects of the service (i.e. the value 'customer satisfaction') and the process in terms of open and closed questions.
4. Project managers discuss these interviews for each project separately in a weekly team meeting together with their direct line manager. Project managers are asked to explain the customer's appreciation plan. If appropriate, recommendations are formulated to change procedures. At the time of the research, no formal targets with sanctions were in use.
5. Afterwards, project managers personally contact customers who claim to be unsatisfied.

On face value, this process makes a good impression. A major difference with the previous cases is that Liander actively seeks interaction to fully understand what customers actually want. But again, we also observe that the amount of interaction is marginal. The interaction, moreover, has hardly any direct effect on the trade-offs in future projects. First of all because the interaction is not about making trade-offs. Instead, the customer gives input for one public value only. There is no discussion with the customer. This one-sided information then is passed on to the project managers who, again, is fully responsible to incorporate these extra demands for improving customer satisfaction within the existing constraints of their daily work. It is up to the project manager, without clear guidance, how to adapt trade-offs in future projects.

The dominant image is the vulnerability of good intentions and the currently unrewarding work of supporting staff to spell out the value customer satisfaction in all its subtleties. The organized interaction with customers is in no way supportive for the underlying complex trade-offs in daily projects.

This problem reflects in our interviews with project managers. Project managers say things like: 'What does a customer know about the conditions under which we work?' 'A customer does not see what we do, so is not able to judge us.' 'Maybe the customer is just unsatisfied about something else, and do we measure that.' Staff members at Liander tend to read these responses of project managers as unwillingness to pay more attention to customer satisfaction. These responses, however, can also be read as a defence. Project managers explain that, given the conditions of their work, they face too many disincentives to focus on further improving customer satisfaction. They feel over-constrained by bureaucratic rules and targets and do not see the possibility to adapt their working routine even more, despite their human drive to always keep improving their personal relationship with customers.

This case shows the coping tensions between staff and operations in optimal form. While supportive staff puts many efforts in interacting with customers to prioritize their wishes and demands, project managers feel compelled to counteract these efforts because it hardly supports them in making better trade-offs.

Analysis: Marginal interaction and organizational friction

In all three cases, marginal interactive decision-making leads to organizational friction. Unanticipated conflict emerges in the operational stage of the project. For example, a project manager needs to re-negotiate why a municipality should pay for what the DSO considers safe enough. In general, project managers face a constant quandary to either help more or less customers with respectively less or more dedication. When project managers would seriously engage in stakeholder interaction to jointly decide on these trade-offs, this would often require systematic deviation from the trade-offs arranged in the planning stage. Many stakeholder values are brought into the DSO via regulation, strategic agreements and planning systems, and channelled through to key decision loci like Asset Management. By means of their risk matrix, asset managers decide on procedures, standards, technical rules and budgets. In each of the case studies above, however, the need to re-open and re-negotiate trade-offs in the operational stage is generally not anticipated. And the unplanned conflicts caused by interaction are largely left at the discretion of project managers and result in friction between the operational level and the upper managerial and staff levels.

	Case 1	Case 2	Case 3
Project	relocating the grid for urban development	removing the grid to improve dykes	running a customer contact evaluation system to increase customer satisfaction
Frequency	repetitive	singular	continuous
Cause	urban plan (external)	dyke safety norms (external)	strategic DSO ambition (internal)
Stakeholder	municipality	water board	customer
Interaction	<ul style="list-style-type: none"> • Municipality makes an urban plan • DSO makes an offer to relocate the grid • DSO and municipality meet to sign a contract • DSO realizes project 	<ul style="list-style-type: none"> • Water board demands DSO to remove grid during a dyke reconstruction project • DSO joins the project but tries to re-negotiate the project at a strategic level • Negotiations continue 	<ul style="list-style-type: none"> • DSO interviews customer • Customer provides input • DSO interprets input
Value conflict	costs client vs. costs DSO	flood safety vs. energy grid values	customer satisfaction vs. bureaucratic constraints
Loose couplings (within DSO)	discretion to deviate when project managers interpret technical rules	operational conflict escalates to upper managerial and staff levels to re-negotiate external demands	staff-generated performance information guides project managers, without strict targets
Outcomes	realized projects and invoices sent	delay, an agreement, no real outcomes yet	marginal adaptation to work routines, more awareness

Figure 4: Differences across the three case studies

From a coping perspective, this organizational conflict or friction is not only dysfunctional but, at least in theory, may also form ‘loose couplings’ (Orton & Weick 1990) between the planning and operational stage. They may allow project managers to improvise and be responsive to stakeholders. In each of the three case studies, there are some precautions arranged or spontaneous instances to

be used as loose couplings, but, at the end of the day, the DSO generally cannot tell whether certain re-opened and re-negotiated trade-offs are still aligned with its stakeholder values, or not. Moreover, all case studies signal a lack of opportunity for project managers to deviate from the bureaucratic constraints and their mono-value safeguards. The limited amount of interaction and flexibility at the operational level is a sign that these ‘loose couplings’ are, perhaps, not loose enough.

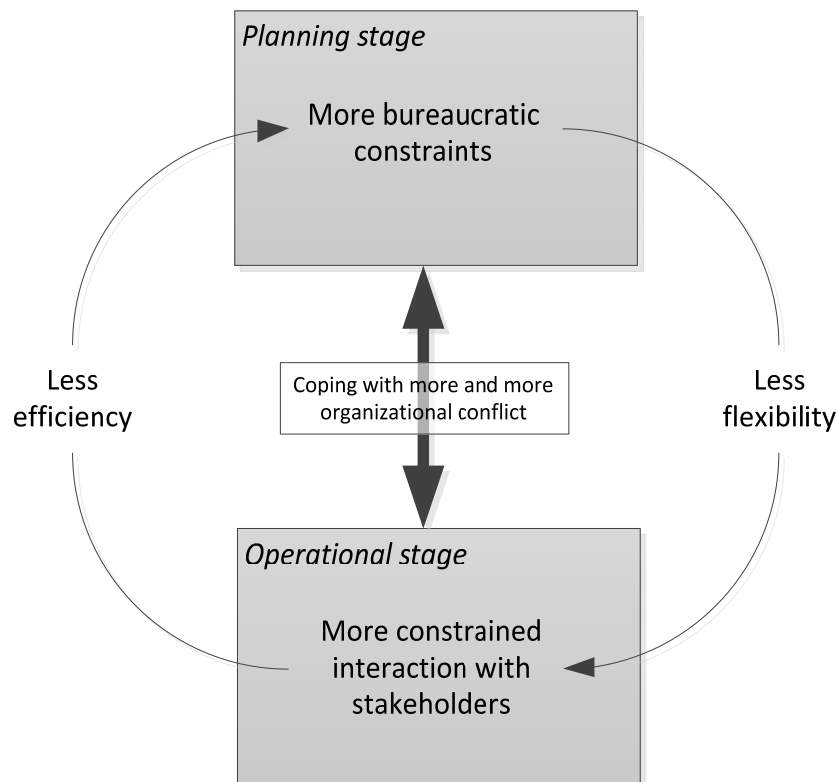


Figure 5: Vicious circle of organizational conflict

With regard to the framework on stakeholder engagement (see Figure 3), all three cases resemble type 1 in which the influence of interaction remains minimal. But the case studies, nevertheless, also showed many differences (see Figure 4). Key variables that differed across the cases were the cause of interaction, the role of the main stakeholder, the course of stakeholder interaction, the loose couplings within the DSO, the main values at stake and the outcomes of the interaction process. The shared pattern of stakeholder interaction (Figure 3) in combination with the many differences across three case-studies (Figure 4) appears significant enough to suspect that our analysis is more universal than these three case-studies alone. It does not seem to matter much what causes interaction or how the DSO organizes interaction. At the end of the day, project managers face the value conflicts that emerge from stakeholder interaction with only little opportunity to align their coping strategies with the trade-offs made in other stages and at other levels within the DSO.

How would this pattern of interaction and coping within a DSO develop over time? One could reasonably understand the reflex when staff departments in the planning stage are faced with the consequences of interactive decision-making in these cases. Within the current bureaucratic context, interaction is generally considered time consuming, inefficient and ineffective, but project managers anyhow cannot refrain from interacting. Ironically, when interaction consequently fails to be worth the efforts it takes, staff departments will be triggered to invent new procedures, standards, stricter targets and other bureaucratic solutions, more likely to further constrain than to support interaction

at the level of project managers. It is far more understandable to strengthen bureaucratic constraints than to loosen them in response to failing interaction, though the bureaucratic reflex obviously complicates interaction even further. This mechanism can be summarized as a vicious circle (see Figure 5). Given the current interaction practices within Liander, its ambition to fully align internal processes with stakeholder values holds the systemic risk that more and more conflicts are buffered in the organizational tension between the planning and the operational stage, without improving any trade-offs.

Conclusion

As stated, the ambition of Alliander is beyond corporate social responsibility. The ambition is to *give* responsibility *back* to its social environment, to let stakeholders arrange the trade-offs. The presumption is that this radical strategy enables the DSO to fully align its process with the values in its environment. A first step in toward this strategy is to obtain insights into how the organization and some of its stakeholders currently interact. As expected, this first analysis of stakeholder engagement shows room for improvement. Stakeholders are not actively enabled to co-decide on the trade-offs Liander needs to make. There is marginal interaction and it takes place within a decision space strictly constraint by bureaucratic conditions, standards, rules and regulations. Generally, interactive decision-making in the cases above does not enable the DSO to improve trade-offs.

The challenge to arrange for custom-made trade-offs systematically comes down to the very operational level of individual project managers. The difficulties to interact at this level generally correspond with the coping strategies found in previous studies (Steenhuisen 2009). The evident implications for interactive decision-making have been clearly illustrated. If Liander would be 100% responsive to stakeholders when arranging trade-offs, project managers would require substantially more discretion and guidance to organize for this interaction. The current bureaucratic context of infrastructure projects, however, structurally denies project managers the discretionary room, the guidance and the time required to pursue interactive decision-making. This bureaucratic context constrains project managers coping and interacting with stakeholders. Heavily constrained interaction leads to inefficiency and starts a vicious circle. Inefficient interaction triggers staff departments to invent new procedures, standards, a new division of tasks and other bureaucratic solutions, further constraining interaction at the level of project managers most of the time.

At first glance, this empirical account of one organization may illustrate either unwillingness or incompetence to interact with stakeholders. However, a more universal phenomenon is at play here. We interpret our data as the very consequence of interactive decision-making while coping with complex trade-offs in heavily constrained project contexts. Learning how to master this challenge is evidently not a matter of articulating the strategic ambition to do so but, in our view, calls for a fundamental reconsideration of the current organizational constraints.

Three suggestions for future research are, first, to further explore the possibilities and limitations of DSO's to organize new forms of interaction with their stakeholders, for example by analysing analogies and counterparts across organizations dealing with similar infrastructure projects in similar contexts. Second, pilot testing these new forms of interaction within DSO's would be a great opportunity for action research. Third and finally, this paper also points at the need for a more fundamental reflection on the roles of DSO's with regard to its stakeholders in operating and developing infrastructures in partly liberalized and partly regulated sectors.

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