



The governance challenge of implementing long-term sustainability objectives with present-day investment decisions

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ABSTRACT

Grand sustainability challenges and international sustainability agreements require national and local governments to further incorporate sustainability as part of their present-day investments in infrastructure. To strengthen public procurement as a policy tool for enhancing sustainability, recent systematic literature reviews call for more research on the interactions between actors in tender processes. Therefore, this article combines a governance lens with a process tracing approach to explain why it is difficult for governments to reach sustainability objectives with their present-day investment decisions. The results derive from a longitudinal case study of the investment process in a Dutch water pumping station and are based on primary documents, interviews, and observations of the tender procedure between 2017 and 2019. The research reveals that risk avoidance, goal satisfaction, and budget compliance interfere with the implementation of national and international sustainability objectives at the local level. There is need for more attention on learning as part of procurement procedures, scale flexibility to realize sustainability objectives efficiently and effectively, and prioritization of conflicting long-term objectives to avoid implementation gaps.

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1. Introduction

To combat grand sustainability challenges, such as climate change and clean energy, most countries worldwide have committed to international agreements such as the United Nations Sustainable Development Goals (SDGs) and the 2015 Paris Agreement of the United Nations Framework Convention on Climate Change (UNFCCC). Implementing these agreements requires national and local governments to invest substantial resources and further incorporate sustainability as part of their present-day procurement and investment decisions (Hueskes et al., 2017; Pinz et al., 2018). The United Nations has explicitly recognized that achieving sustainability will not be possible without public–private partnerships (PPPs) because of the required resources, expertise, and implementation capacity (Marx, 2019). PPPs are often necessary to realize public infrastructure (Koppenjan and de Jong, 2018). Governmental investment in infrastructure provides an important opportunity for incorporating sustainability as these decisions require substantive resources and a long-term time horizon given the long lifespan of infrastructure. Prior research has positioned

public tendering and procurement as an important policy tool that could help governments to achieve desired societal outcomes (Grandia and Meehan, 2017; Sönnichsen and Clement, 2020). Sustainable public procurement (SPP) attempts to incorporate social, environmental, and economic criteria into public tenders to stimulate sustainable goods and services (Cheng et al., 2018; Lăzăroiu et al., 2020).

However, a systematic review of Cheng et al. (2018) questions the effectiveness and efficiency of SPP as a policy tool. Furthermore, the review of Pinz et al. (2018) concludes that PPPs' contribution to the accomplishment of sustainability-related objectives is uncertain. PPP arrangements are not always the most cost-efficient or effective way to achieve objectives (Marx, 2019) and tensions can arise between the private sector's shorter-term commercial interests and government's long-term sustainability objectives (Koppenjan and Enserink, 2009). Many scholars have listed and discussed barriers for SPP, such as a lack of awareness and familiarity, political commitment, and budget constraints (Brammer and Walker, 2011; Cheng et al., 2018; Günther and Scheibe, 2006).

To strengthen public procurement as a policy tool for enhancing sustainability, recent systematic literature reviews call for more research on the interactions between actors in tender processes. Lupova-Henry and Dotti (2019) recommend shifting focus from

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who should govern, to understanding how different actors interact with each other. Cheng et al. (2018) identify the need to analyse the characteristics and constraints of different tender arrangements. Sönnichsen and Clement (2020) argue that the role of essential market dialogue needs to be better understood. In order to understand and explain why governments do not reach desired outcomes with public procurement, it is necessary to unravel the interactive procurement process in detail and link observed outcomes to plausible causes. This means going beyond identifying barriers to SPP and moving towards analysing the underlying causal mechanisms (Biesbroek et al., 2014; Termeer and Metze, 2019). Pinz et al. (2018) also call for more longitudinal causal inference studies to develop generalizable findings that explain why governments succeed or fail in realizing sustainability objectives with procurement and tender procedures.

This article addresses this gap by explaining why it is difficult for governments to achieve long-term sustainability objectives with their present-day investments in infrastructure. It contributes to the literature on SPP in two ways. First, this article does not focus on analysing success factors and barriers to SPP but, using the process tracing method, reveals the underlying mechanisms that come into play when governments try to reach sustainability objectives. Process tracing helps to show how and why outcomes are generated when specific contextual conditions (or barriers) are present (Beach and Pedersen, 2016; Biesbroek et al., 2014). Second, the article will focus on the interactions and dialogues between the public and private sector in realizing sustainability outcomes, through analysing a case in which the Competitive Dialogue (CD) procedure was applied. To contribute to existing literature about the CD procedure (Haugbølle et al., 2015; Uttam and Le Lann Roos, 2015), this article will not solely focus on the procurement procedure or details of the tender arrangement but on the entire decision-making process for public infrastructure investment. The case selected is that of an investment in a water pumping station by a regional water authority that was trying to achieve long-term sustainability objectives that were part of a national climate change agreement. Showing how a national climate change agreement is implemented at the local level also generates lessons for future implementations of international sustainability agreements such as the SDGs.

This article proceeds as follows. Section 2 introduces the concept of sustainability objectives and the governance lens that is used to analyse the decision-making process in more detail. Section 3 elaborates upon the methods used in this study. Section 4 presents the case results in the form of a chronological narrative and the causal mechanisms involved. Section 5 links the results to previous literature and highlights key findings. The article ends with a short conclusion.

2. Theoretical background

This section introduces the outcome of this study – long-term sustainability objectives – and the governance lens to understand the decision-making process.

2.1. Understanding the outcome: long-term sustainability objectives as part of infrastructure investment decisions

Three interrelated concepts – investment decisions, forward-looking decisions, and long-term sustainability objectives – guide the analysis of changing sustainability objectives.

When governments invest in critical infrastructure, they make a decision to extract resources in the short term for the creation of goods with long-term value. Therefore, such a decision is a long-term investment decision, or policy investment as Jacobs (2011)

calls it. Long-term investment decisions, however, are not necessarily forward-looking decisions, meaning that decisions explicitly anticipate future challenges through a long time horizon to understand future challenges, the adoption of flexible and/or robust solutions, and a forward-looking justification in the form of scenarios, long-term objectives, or visions (Pot et al., 2018). This research does not assess whether decisions are fully forward looking but focuses on one element of this particular concept: that of long-term objectives and organizations' desire to achieve specific long-term objectives with present-day infrastructure investments.

Long-term objectives are "objectives concerning the future that must be reached by taking decisions today" (Meuleman and in 't Veld, 2010). Such objectives can be formulated with a specific long-term time horizon, e.g., "we need to become energy neutral by 2050", but can also have indefinite time horizons, e.g., "we aim to become a frontrunner in sustainability". Long-term sustainability objectives are those objectives explicitly targeted at sustainability (Pinz et al., 2018). Sustainability in its most broadly accepted definition refers to satisfying the needs of the present generation without compromising the ability of future generations to fulfil their needs (Brundtland, 1987). Therefore, in essence, sustainability objectives are always long-term oriented. Sustainability encompasses three aspects, also sometimes referred to as Triple Bottom Line or Triple P (Armenia et al., 2019): economic sustainability, ecological or environmental sustainability, and social sustainability.

Because sustainability is an ambiguous concept (Hueskes et al., 2017), an inductive approach is adopted to explore how sustainability objectives changed over the course of time in the selected case (see section 3).

2.2. Understanding the process: top-down and bottom-up implementation of long-term objectives

This section builds on literature in the field of implementation, governance, and public sector procurement. In the implementation literature, a key divide is that between top-down and bottom-up implementation. The top-down strand creates a distinction between policy formation and policy implementation and focuses on the achievement of policy goals laid down in an official policy document (Pressman and Wildavsky, 1973). The bottom-up school, on the other hand, focuses more on the discretion and action of bureaucrats that establish policies through, amongst other things, their interpretation of policy goals, their use of their networks, and their use of rules (Lipsky, 1980). Network governance is one of the theoretical approaches that synthesize elements of this top-down/bottom-up debate (Cairney, 2009; Hill and Hupe, 2002). This article incorporates elements from both sides. From the top-down perspective, a decision is understood as a formal decision that stipulates the long-term objectives to be achieved. The objectives themselves can – and are likely to – come from a higher level of government and these objectives will then need to be translated into organizational visions and regional or local strategic plans – something a formal law such as a climate act can even prescribe (e.g., the newly adopted Dutch climate act of 2019 prescribes that the national government writes a climate vision). These formal decisions, however, should be seen as the – intermediate – result of the previous interactive process. This is where this study departs from the top-down perspective and uses the network and interactive governance lens to understand the implementation – or governance – process leading to the making of specific decisions. Moving beyond the hierarchy-network-market trichotomy (Lupova-Henry and Dotti, 2019), this article focuses on the dynamic governance process that produces decisions and influences outcomes. This governance process consists of multiple and interacting governmental layers and levels, actors and objectives, and decisions and stages.

These different interactions are now briefly elaborated. First, there are multiple layers and levels. Multiple *layers* refers to the involved formal political-administrative institutions. Interacting layers, for example, means that national level policies need to be implemented at local level. Interacting *levels* refers to the levels of analysis: whether the decision-making and implementation process is visible at the individual, the organizational, or the inter-organizational level (Hill and Hupe, 2002).

Second, there are multiple actors and objectives. During processes of implementation and decision making, the multiple *actors* involved impact the decisions made. Actors can be individuals, groups, organizations, and groups of organizations (Klijn and Koppenjan, 2016). Involved actors are autonomous and can therefore have different, sometimes conflicting, *objectives*. For example, the private sector's short-term interest in profit and return on investment may conflict with the government's long-term objectives and responsibilities (Koppenjan and Enserink, 2009). To achieve desired objectives, actors need one another's resources and are therefore interdependent. This interdependence forms the basis of their interaction (Klijn and Koppenjan, 2016). In the infrastructure domain, the government is dependent on the private sector to realize its objectives and for the renovation or realization of infrastructure. In this domain therefore, it is important to include inter-organizational arrangements, and especially PPPs, in the implementation process (Marx, 2019; O'Toole, Jr., 2014). Increasingly, with new types of tender arrangements being developed, private sector involvement is not limited to project execution but is also part of the public sector decision-making process. For example, the government may consult private sector parties, be active in processes of co-creation, and may try out new tender procedures that allow for more interaction with the private sector before final tender, such as the competitive dialogue procedure (Hoezen et al., 2012; Uttam and Le Lann Roos, 2015).

Third, there are multiple *decisions* and *stages*. From the bottom-up perspective on implementation, decision making should not be seen separately from implementation, as actors continuously produce mutually impactful decisions. Furthermore, a decision is not solely the decision of the political body, the organization, or one single actor (Scharpf, 1997; Williams et al., 2017). Rather, the decision is influenced and prepared by bureaucrats such as project managers, purchasers, policy advisors, and directors. This multiple decision and stages idea is also key to the rounds model of decision making (Klijn and Koppenjan, 2016; Teisman, 2000): this model conceptualizes series of interactions between actors as rounds. This rounds model is also of value to cover the *different stages* of a procurement process. During rounds, actors interpret rules and select strategies based on their understanding of the problem. The beginning and the end of a round are marked by *crucial decisions*. These crucial decisions can be identified from a change in the composition of actors, in the content (problem definitions, solutions, and so on), and/or in the interaction process. This article focuses on change in content in terms of changing long-term (sustainability) objectives.

3. Method

3.1. Process tracing

This study adopts a theory-building process tracing approach that elucidates why it is difficult for governments to reach long-term sustainability objectives with their present-day investment in infrastructure. Process tracing (PT) is especially suitable for understanding the influence of dynamic and interactive processes on a specific outcome (Beach and Pedersen, 2016). Theory-building PT traces back the outcome occurring at a specific juncture to the

initial conditions and aims to unpack the black box between X and Y (Mayntz, 2004). It does so by reconstructing a historical chain of events to unravel a plausible mechanism or set of mechanisms that explain what happened (Goertz, 2017). Mechanisms refer to the causal processes between a condition or set of conditions and the outcome of interest. Mechanisms consist of a series of parts, and these parts are composed of entities engaging in activities (Beach and Pedersen, 2016). The entities (actors) are the individuals or organizations with their belief systems and experiences. The activities are the entities' strategies and acts that produce change (Biesbroek et al., 2014). In order to answer the research question, this article focuses on the combination of actors' strategies and acts that cause long-term sustainability objectives to become disconnected from infrastructure investment decisions. Therefore, the need to invest in an infrastructure is the condition and long-term sustainability objectives are the outcome. Within-case variation provides different values for the outcome of interest (Seawright and Gerring, 2008). Fig. 1 shows the relationship between mechanisms and their components, the starting condition, and the outcome.

3.2. Case selection and scope conditions

The following case selection criteria were used:

- Presence of contextual factors: inter-organizational agreements that include sustainability objectives, a PPP arrangement, and a public sector organization with democratically elected governing bodies.
- Additional efforts to anticipate the future with the infrastructure investment: sustainability objectives that became connected to an infrastructure investment.
- Accessibility: accessibility seems a pragmatic criterion but is relevant because many tender procedures are protected with confidentiality agreements. The researcher needs to be trusted by the organization to gain access to information about public-private interactions.

On the basis of these criteria, the case of the Vissering water pumping station (PS-V), owned by the Dutch regional water authority Zuiderzeeland (RWA-Z), was selected. RWA-Z aimed to renovate PS-V in the years between 2017 and 2020 and had formulated the ambition to realize the "world's most sustainable water pumping station" in its investment decision of 2017. RWA-Z granted access to all documents relevant to both the PS-V renovation project and the tendering procedure and allowed access to specific meetings during the process. A limitation is that it was not possible to directly observe the conversations between market parties and government during the dialogue phase of the CD procedure because of confidentiality agreements. However, accessing all internal meetings and documents as well as interviewing one market party during the process enabled the researcher to mitigate data gaps.

3.3. Data collection

A longitudinal approach to data collection was adopted to trace back to the origin of the investment process. Data collected consisted of primary documents, observations, and interviews (see Appendix A).

Observations of CD procedural phases took place during the period September 2018 to April 2019. The CD procedure structures the PPP process according to different phases: pre-launch, short-listing phase, dialogue, and selection (Uttam and Le Lann Roos, 2015). The observed events consisted of: market consultation day

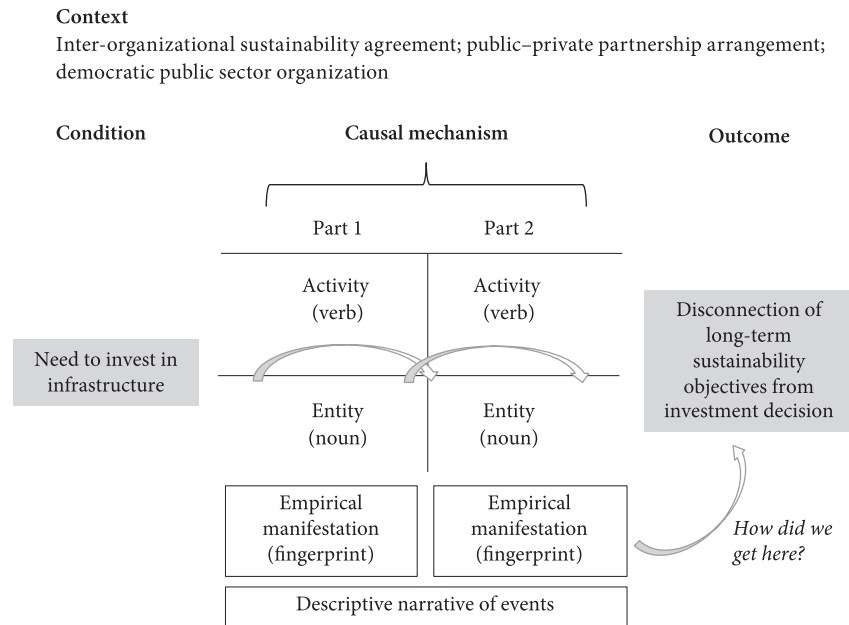


Fig. 1. Relationship between mechanisms and their components, conditions, context, and outcome (adapted from Beach and Pedersen, 2016).

(pre-launch phase), dialogue team meetings (dialogue phase), assessment day, meetings between the dialogue team and the executive directors and line manager, executive assembly meeting with tender decision (selection phase), and an evaluation with market parties.

While the CD procedure progressed, conversational and informational interviews ($n = 19$) were held with members of the project team, the dialogue team, the steering group, and one market party. Planned informational interviews and observations of the dialogue and assessment team were recorded.

To not only include the CD part of the process but open up the entire decision-making and implementation process, documents were collected ($n \geq 180$), including all RWA-Z multi-annual budgets between 2001 and 2018, all RWA-Z rolling forecasts and investment plans between 2010 and 2018, all decision documents about PS-V, all tender and contract documents about PS-V, all minutes and project team presentations of the PS-V project during the different CD phases, and relevant organizational long-term plans and related decisions.

Finally, by means of a member check, written results were shared with three involved RWA-Z actors, and the results were presented to seven involved RWA-Z actors in September 2019. The results were acknowledged and confirmed.

3.4. Data analysis

The collected data were entered in the Atlas. ti program for coding purposes and analysed according to the following steps. First, to analyse the process, a chronological narrative of events and decisions was developed (Beach and Pedersen, 2016; Klijn and Koppenjan, 2016). The narrative described what happened when, with what content, and with whom to reveal the entire decision-making process. Codes were developed inductively mainly for how PS-V was discussed in the data (e.g., “renovation of the pumping installation”, “reliability and availability”, “heat and power plant”). Coding continued until the narrative was saturated and no new data emerged. Second, to analyse the outcome, the crucial decisions were identified, based on changing substantive content about PS-V (Teisman, 2000). The decisions used were those laid

down in written and publicly available documents that also informed the political-administrative bodies. To capture the specific formulation of long-term sustainability objectives in the crucial decisions, data were coded inductively with codes using the organization’s exact words, such as “fish passage”, “social relevance”, “energy self-sufficiency”, and “CO₂ reduction target”. Third, on the basis of the chronological narrative, a flowchart was developed to connect events, actions, and consequences. In this step, the guiding question “How did we get here?” was used to match variance of the outcome with the events during the process (Beach and Pedersen, 2016). Fourth and last, the different chains of events were further analysed to find empirical manifestations (“fingerprints”) of the causal mechanisms that could explain the variance of sustainability objectives over time. In this step, the activities of actors that produced change were sought out. Also, each of these parts needed to be a necessary part of the full explanation: without it, the mechanisms would not occur. Counter-factual reasoning was used to verify this: if something had not occurred, how would the outcome have changed? Furthermore, for all parts, findings were triangulated and checked to see whether other sources indeed confirmed their presence. Findings were then compared with existing theory.

4. Results

4.1. Historical background and chronology of events

Dutch regional water authorities (RWAs) are “functional democracies” and as such have predetermined tasks that are limited to water management, have specific taxation powers and earmarked revenue, and have their own democratically elected governing bodies (Mostert, 2017). RWA governing bodies consist of a general assembly (GA), an executive assembly (EA), and a chairperson. The RWA-Z geographical area is almost completely below sea level: between four to 6 m on average (tender document shortlisting phase 2018, RWA-Z). Every day, even on dry days, RWA-Z needs to use its pumping stations to pump water from the polders to the open water (water management plan 2016–2021). This means that about two-thirds of its total energy consumption is

used for pumping and one-third for wastewater treatment (rolling forecast 2012–2015). Almost all energy is purchased instead of produced and, to compensate for purchased energy, RWA-Z buys guarantees of origin (GOs) of European thermal energy (tender document shortlisting phase 2018; GA proposal energy and pumping stations 2015).

RWA-Z owns seven pumping stations in total. PS-V is one of the three pumping stations that manage the water level in the northern area of RWA-Z. PS-V, built in 1942, contains three pumps powered by two gas engines and one diesel engine. In the past decades, the gas engines had reliability issues and consequently relatively high maintenance costs (LCC calculation document 2012). In 2000, the PS-V building was registered as a national monument by the national government.

Table 1 summarizes the descriptive narrative of the efforts to renovate PS-V and make it more sustainable, based on national climate agreement objectives.

4.2. Changing sustainability objectives over time

Comparison of the content of the crucial decisions over time reveals a change in long-term sustainability objectives and ambitions between 2010 and 2019. Overall, the PS-V ambition changed from a mere “renovation of the pumping installation” (water pumping plan 2011–2020), to realizing the “world’s most sustainable water pumping station” (GA proposal, Feb. 2017), to realizing “the most sustainable water pumping station of its kind” (GA proposal 29 May 2018). To this final ambition, dialogue team members jokingly added “on these [geographical] coordinates” (fieldnotes dialogue round 2, 3 Oct. 2018). The need for renovation is central to the water pumping plan 2011–2020. In the 2016 decision, the long-term sustainability objectives of energy efficiency and energy self-sufficiency were connected to the PS-V renovation. In 2018, energy self-sufficiency disappeared again and the final solution used electricity from the general energy grid for the pumps’ permanent magnet engines; and the organization arranged to compensate this by buying GOs from the windfarm in which they agreed to participate. Furthermore, in the decisions from May 2018 onwards about PS-V, sustainability was specifically translated into energy-efficiency and mitigating environmental impact measures (tender document dialogue and selection phase; Table 1).

4.3. Mechanisms behind disconnecting long-term sustainability objectives from present-day investments in infrastructure

In this section, the mechanisms that explain how sustainability objectives became disconnected from the PS-V renovation are unravelled. The first mechanism is that of *budget compliance* (Fig. 2). This mechanism was triggered because, in 2010, the department responsible for water pumping stations signalled the approaching technical end-of-lifetime of PS-V and included the PS-V renovation in the multiannual investment plan (investment plan 2010–2013). Consequent to a cost-benefit analysis, the department set the renovation date at 2017–2020 with a budget of €9.755 m for all PS-V investments (incl. €9.5 m for the renovation of the pumps; water pumping plan 2011–2020). This initial budget remained the same throughout, despite later connections to sustainability objectives. In discussions about realizing the national climate agreement and organizational energy strategy objectives, the GA pushed for closed business cases and budget neutrality for tasks outside the primary water management tasks (GA minutes, 29 Sept. and 24 Nov., 2015). In response, the sustainable energy project team developed a “masterplan sustainable energy”, which stated that investments in sustainable energy projects had to involve a closed business case with a return on investment within

the lifetime of the specific asset. When the PS-V project team created the assembly proposal for allocating investment budget to the PS-V renovation and sustainability in spring 2018, the long-term sustainability goals of thermal energy and energy self-sufficiency received only optional budgets. Such budgets meant that business cases would later have to be approved by the GA, to be decided upon after tendering PS-V (tender document dialogue phase). Market parties perceived the optional budgets as something for which they did not need to develop any further plans (market evaluation, Apr. 2019). RWA-Z explicitly discouraged plans for optional budgets, stating it was “not allowed to propose measures for optional budgets within quality documents” (Q&A tender information notice). Market parties did not include thermal energy and energy self-sufficiency measures as part of the submitted tenders.

A second mechanism that disconnected long-term sustainability objectives was *goal satisfaction* (Fig. 3). This mechanism was triggered when RWA-Z put a project team in place to translate a 2010 climate change agreement between regional water authorities and the national government (see Table 1). The project team developed an energy strategy (2013) and masterplan for sustainable energy (2016). The masterplan included exploring wind energy solutions, which were argued to contribute significantly to reaching the objectives. When the GA discussed the final masterplan, it asked the organization to “seize opportunities and do what is possible within the [financial] boundaries” (GA proposal masterplan, 26 Sept. 2016; GA minutes, 31 May 2016). The sustainable energy project team started actively exploring options from that point onwards and in 2018 proposed a collaborative investment in a windfarm opportunity. In that proposal, the project team framed the construction of participation and receiving GOs in return as enabling energy self-sufficiency according to a broad definition of the concept (GA proposal windfarm, 27 Mar. 2018). In the same proposal, the energy self-sufficiency measures that were not yet fully developed and that were linked to the organizational water infrastructure were no longer invested in, including solar energy initiatives, wind turbines on dykes, and thermal energy at PS-V. The proposal about the windfarm now framed PS-V as an energy conservation project (GA proposal windfarm, 27 Mar. 2018). In the decision of May 2018 about the renovation and sustainability of PS-V, the thermal energy and energy production activities were placed outside the investment sum (GA proposal PS-V, 29 May 2018). Thermal energy was reduced to mere facilitation (tender document dialogue and selection phase).

Third, there was the mechanism of *risk avoidance* on the side of both the government and the market parties (Fig. 4). This mechanism was triggered by the start of interactions with the private sector. In 2017, the PS-V project team organized a market consultation day at which it presented the objective of realizing the “world’s most sustainable pumping station” (purchasing plan for PS-V, Jul. 2017; presentation market consultation day, Sept. 2017). During the market consultation phase, market parties asked RWA-Z to define the sustainability criteria more clearly and separately from CO₂ emissions reduction (project team minutes market consultation conversations, Oct. 2017, incl. Q&A filled in by market). During the investment and tender process, both the responsible assembly member and the department manager strongly emphasized reliability and availability, emphasizing strict capacity requirements and placing emergency stream generators within the scope (water pumping plan 2011–2020; minutes conversation head of pumping stations department, Jun. 2017). Also, the GA requested the specification of award criteria for CO₂ and sustainability to avoid legal claims (GA minutes, 29 May 2018). During the dialogue phase, two market parties critically assessed their motivation to realize an “iconic” or “prestigious”

Table 1
Summary of empirical narrative and crucial decisions.

Round	Summary empirical narrative and crucial decisions
1. Need to renovate PS-V 2008–2013	<p>In 2010, RWA-Z renewed its water drainage plan for the years 2011–2020 and postponed the PS-V “renovation of the pumping installation” and its budget of €9.5 m from 2011 to 2017 based on a cost-benefit analysis (rolling forecast 2011–2014; water pumping plan 2011–2020). In 2012–2013, RWA-Z translated the following national climate change agreement objectives into an “energy strategy”:</p> <ul style="list-style-type: none"> - 30% energy efficiency in 2020 (in the energy strategy, RWA-Z expected to reach only 5% for the pumping task) - 40% energy production/self-sufficiency in 2020 (RWA-Z adjusted this to 35–45% in 2030 because of the high energy consumption for the pumping task) - 30% CO₂ emissions reduction in 2020 - climate neutral water management in 2050 (GA proposal Energy Strategy, 2013). <p>Crucial decision 1 2010: Water pumping plan 2011–2020: long-term sustainability objectives are not (yet) explicitly connected to the renovation of PS-V.</p>
2. Need to make PS-V sustainable 2015–2016	<p>In 2015, the Energy and Pumping stations project formulated the ambition to “make the energy consumption of drainage more sustainable” and to become “leading in energy-efficient polder drainage” (rolling forecast 2016–2019). The project team, also responsible for a “masterplan sustainable energy”, expected PS-V to contribute 4–5% to energy-efficiency and CO₂ reduction targets, by using electric engines, and 3% to energy self-sufficiency, by producing thermal energy. By connecting energy self-sufficiency, CO₂ reduction, and the “design principle of sustainability” to the PS-V renovation, the masterplan project team argued that PS-V “could become the most energy-efficient large surface water pumping station of [RWA-Z] and possibly of the Netherlands or Europe” (masterplan sustainable energy). At the beginning of 2017, the assembly agreed to free up budget for the renovation and sustainability of PS-V.</p> <p>Crucial decision 2: 2016–Dec.: Preparatory investment budget for the renovation and sustainability of PS-V. This decision connected a number of long-term sustainability objectives to PS-V: a fish migration system to meet Water Framework directive requirements of 2017; energy efficiency and energy self-sufficiency to meet objectives of the national climate agreement; and the ambition to realize the “world’s most sustainable water pumping station” (GA and EA proposals budget PS-V, Dec. 2016/Feb 2017).</p>
3. Meeting objectives 2017	<p>In September 2017, the PS-V team informed the assembly that it would adopt the CD tendering procedure. The presented project scope on the market consultation day included: renovation of installations and pumps to ensure reliability and availability, sustainability (of the energy supply), energy production with wind or solar energy, a fish migration system, emergency power generators, the facilitation of thermal energy, the renovation of the building, maintenance responsibility for 15 years, and applying market innovation (presentation market consultation day). The tender guidelines mentioned the following selection criteria under the heading of sustainability: “CO₂ reduction after renovation”; “innovation in relation to energy-efficiency”; and “cooperation between client and contractor”, and included the ambition to make PS-V “one of the most sustainable water pumping stations in the world” (tender document shortlisting phase 2018). In March 2018, the assemblies approved participation in a windfarm to realize “the energy objectives of the regional water authority [in 2022–23, earlier than planned for], including that of becoming energy self-sufficient” (GA proposal windfarm, Mar. 2018).</p> <p>Crucial decision 3: 2018–Mar: Participation in windfarm in which RWA-Z bought a share to produce wind energy based on its CO₂ emissions volume and to receive GOs from this windfarm energy. This decision framed PS-V as an energy conservation project.</p>
4. Scoping 1st half 2018	<p>In February 2018, the business operations manager told the PS-V project team that there was no political mandate based on the 2017 decision about PS-V and a new GA decision was needed (project team minutes of conversation with business operations, 2018; member check). In May, the GA approved the PS-V budget based on an adjusted scope. The scope covered: securing the availability and reliability of the water management system in the north-eastern polder, renewing the pumping installation, renovating the national monument building and other PS-V facilities, realizing the fish migration system, minimum 15 years maintenance, lowering lifecycle costs, reducing the energy consumption and CO₂ emissions, facilitating thermal energy, and other sustainability options (incl. social added value and energy self-sufficiency). However, the facilitation of thermal energy, the energy self-sufficiency of the building, and the social added value were excluded from the investment sum and portrayed as additional options (GA investment budget proposal PS-V). Furthermore, the facilitation of thermal energy would only be done on the basis of a “closed business case” (GA investment budget proposal PS-V).</p> <p>Three criteria were formulated to judge the most economically advantageous tender (MEAT): (1) CO₂ emissions reduction of the pumping installation; (2) sustainability on the basis of reducing the building’s energy consumption and reducing environmental impacts during renovation; and (3) total cost of ownership (TCO) (tender document dialogue and selection phase).</p> <p>Crucial decision 4: 2018–May: The assembly decision changed the overall ambition to “realizing one of the most sustainable water pumping stations of its behind kind”, which the project team explained meant: in comparison to other pumping stations with the same pumping capacity and renovating an existing building instead of building an entirely new one (Q&A developed for EA member for GA meeting May 2018).</p>
5. Sticking to budget and scope 2nd half 2018	<p>Between July and November 2018, the dialogue phase was held. The following sustainability-related proposals or issues of market parties were addressed: emergency power generators (adjustment: allow lease), the available budget (not adjusted), producing solar and wind energy (response: energy production with solar or wind energy not included in CO₂ reduction criterion), realizing a biomass production facility (response: a bridge too far, according to interviewee F, 4 Mar. 2019), the strict demands for the fish passage (adjustment: fish damage changed to fish mortality), flexible pumping (“outside scope”, respondent E, fieldnote 26 Sept. 2018), and using generated heat/thermal energy (“something for after this tender”, respondent I, fieldnote 3 Oct. 2018) (see also steering group presentation, Aug. 2018; Q&A tender information notice). At the end of August and November two market parties withdrew because they could not see how to stay within the available budget and because the “sustainability flag had disappeared” (market evaluation, Apr. 2019). In Jan. 2019, the winning tender was selected. The winning solution included electric direct-drive motors (“permanent magnet”), whose remaining heat was to be used for heating the pumping station building and the motors would realize more CO₂ emissions reduction than aimed for (market parties’ submitted tender offer, Dec. 2018; presentation to executive board, Jan. 2019).</p> <p>Crucial decision 5: 2019–Feb.: The EA’s final decision to award tender.</p>

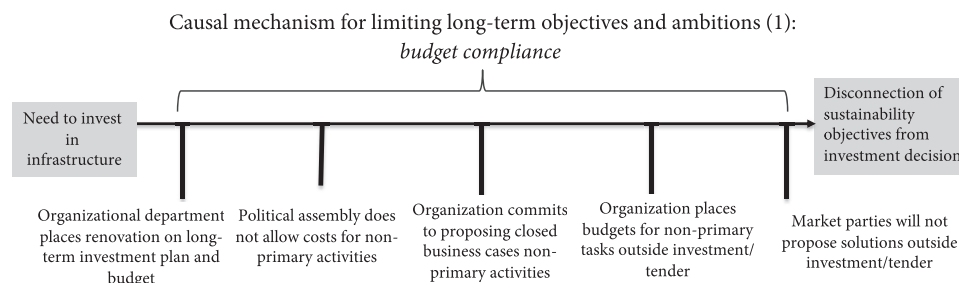


Fig. 2. Causal mechanism for disconnecting sustainability objectives: budget compliance.

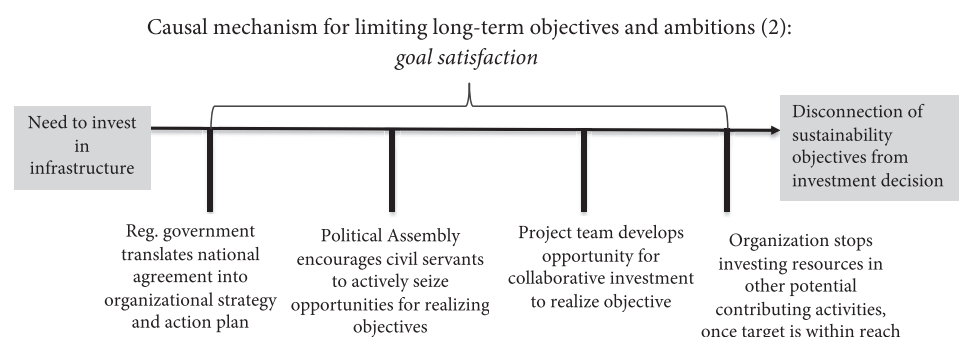


Fig. 3. Causal mechanism for disconnecting sustainability objectives: goal satisfaction.

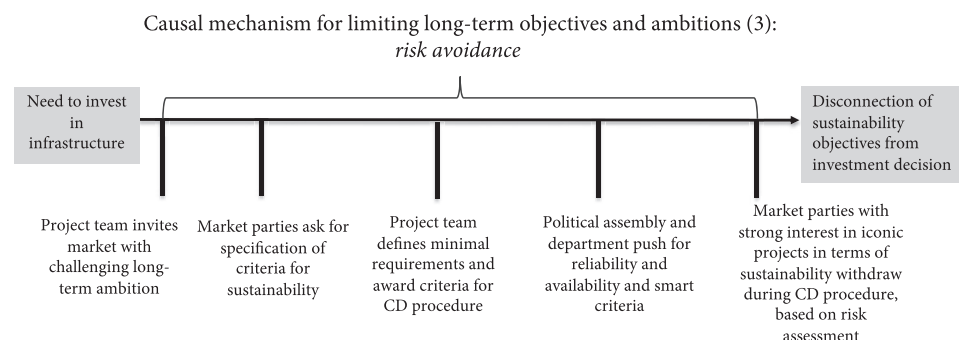


Fig. 4. Causal mechanism for disconnecting sustainability objectives: risk avoidance.

sustainability project against the now set sustainability definitions, reliability and availability criteria, and available budget. For them, PS-V started off as a potential flagship project for sustainability but lost this status along the way (market evaluation, Apr. 2019). A detailed risk assessment led these market parties to decide to withdraw because they saw too few opportunities to meet quality requirements while staying within the budget (market evaluation, Apr. 2019).

5. Discussion

The combination of process tracing and the interactive

governance lens exposed all relevant actor interactions during a decision-making process, where a local government used a CD procedure to achieve long-term sustainability objectives by investing in a particular infrastructure (PS-V). The results revealed three mechanisms, at the individual, organizational, and inter-organizational level, which together explain why it is difficult for governments to achieve long-term sustainability objectives with their present-day infrastructure investments. Each of the mechanisms (M) was triggered by a specific contextual factor (C) and both politics (Po) and market parties (Pr) played a specific role (see Fig. 5). This section discusses the main contributions and implications of the mechanisms.

5.1. Contributions and implications of findings

The first mechanism of budget compliance (M1) is different from the often mentioned barrier of budget constraints in literature on SPP (Brammer and Walker, 2011; Cheng et al., 2018). Budget compliance shows that, once budgets for end-of-lifetime infrastructure investments (C in Fig. 5) are approved by the political legislative and executive powers (Po in Fig. 5), civil servants tend to stick to the initially approved budget. Furthermore, market parties may withdraw once high expectations about sustainability are not met with financial means (Pr in Fig. 5). As market parties are only likely to propose the things that will be awarded at tender, governments risk implementation gaps (Cairney, 2009).

The second mechanism of goal satisfaction (M2) contributes to discussions about the ambiguity of sustainability as a concept, which makes it difficult to implement through procurement (Brammer and Walker, 2011; Hueskes et al., 2017). Goal satisfaction means that organizational members, stimulated by political actors (Po), seek actions that can satisfy inter-organizational sustainability agreements (C) in the most efficient and pragmatic way. The first satisfactory solution to meet objectives is likely to be chosen (see Simon, 1955), which in this case is an external private sector windfarm initiative (Pr). This mechanism shows that long-term sustainability objectives provide flexibility of meaning and of scale. Particular sustainability objectives, such as energy self-sufficiency, can be further defined and stretched so as to fit particular solutions to achieve objectives (Hueskes et al., 2017). Scale flexibility means that an organization may choose to achieve its objectives at the organizational scale (e.g., investing in a windfarm) or at the scale of individual assets (e.g., by realizing energy production facilities at infrastructure assets) (Williams et al., 2017).

The third mechanism of risk avoidance (M3) contributes to discussions of risk perception and risk reduction within PPP and SPP literature. The mechanism reveals that both the government (Po) and the market parties (Pr) aim to avoid infrastructure failure and future legal claims. Furthermore, to mitigate the risk of cost overruns (Flyvbjerg et al., 2004), market parties tend to use strict risk assessment (Pr). The risk adverse attitude of market parties results in a choice for proven technology instead of innovative sustainable solutions (Koppenjan, 2014). The focus on risks in public-private interactions can therefore stimulate robustness and

system redundancy at the expense of sustainability because robustness comes at a price. The risk avoidance mechanism counters the argument of Sönnichsen and Clement (2020) that the CD procedure is useful for mitigating perceived risks through dialogue. Even when governments formulate functional requirements and do not describe desired details of solutions in dialogues (Hoezen et al., 2012), risk avoidance can be very pervasive.

Finally, the combination of the mechanisms contributes to literature that discusses the merits of the CD procedure (Sönnichsen and Clement, 2020) and recommends the use of more participative and collaborative approaches for achieving long-term sustainability objectives (Williams et al., 2017). This research cannot confirm that PPP arrangements, and in particular the CD procedure, contribute to sustainability objectives (Pinz et al., 2018). The CD procedure did not deliver on its merits of risk reduction, flexibility, and dialogue because the stability-enforcing mechanisms of risk avoidance, goal satisfaction, and budget compliance were triggered. The required mandate from the political bodies at an early stage in the procedure and the specification of the contract before the dialogue phase can make it difficult for governments to make changes during dialogue rounds (Uttam and Le Lann Roos, 2015). To benefit from collaborative-oriented tender procedures and achieve sustainability ambitions, governments are advised to incorporate process check-points where adjustments to budgets, objectives, and requirements can be made. At the start of the procurement process, to mitigate risk avoidance and budget compliance, feedback of market parties can be used to determine the budget and define and prioritize long-term objectives as part of award criteria. Another recommendation, to utilize scale flexibility, is that governments create inventories of planned infrastructure investments and of long-term sustainability objectives. These inventories enable governments to select investments that can contribute to sustainability objectives based on, for example, efficiency and impact criteria.

5.2. Implications for future research

The mechanisms suggest three areas for future research. First, more research involvement may be needed to establish learning and knowledge co-creation (Sharma and Bansal, 2020) during tender procedures. This could potentially improve tender

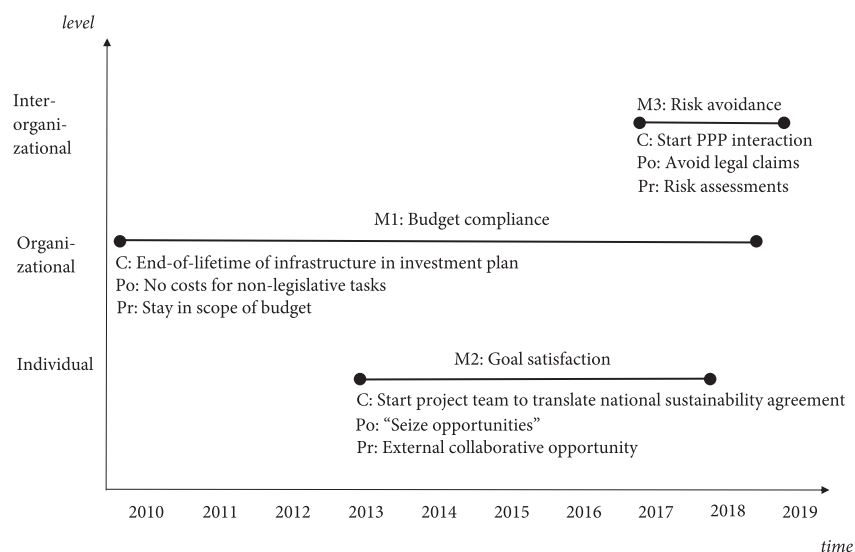


Fig. 5. Overview of mechanisms (M). Note: C = Context, Po = role of politics, Pr = role of private sector. The combination of mechanisms explains how sustainability objectives became disconnected from the PS-V infrastructure investment.

procedure designs that still suit rule-bound, democratic public sector organizations, while also providing room for change and establishing trust. Second, it would be valuable to adopt a social-ecological-technical system perspective to further research possibilities for, and limitations of, using scale flexibility. This is important for mapping potential interactions between decisions, phasing and scaling investments, avoiding potential lock-ins, and prioritizing conflicting long-term objectives (Staveren and Tatenhove, 2016). Lastly, a comparative case study design such as qualitative comparative analysis (Schneider and Wagemann, 2012) could be used to test the portability of mechanisms (Falleti and Lynch, 2009) and explore the combinations of identified conditions – e.g., forecasting end-of-lifetime infrastructure, PPP interaction, and organizational project-team strategizing – that enable higher or lower levels of sustainability in investment decisions.

6. Conclusions

This article aimed to explain why it is difficult for governments to reach long-term sustainability objectives with their present-day infrastructure investment decisions. It revealed three mechanisms that disconnected long-term sustainability objectives from the investment decision: budget compliance, goal satisfaction, and risk avoidance. On the basis of this research, three main conclusions can be drawn for future implementation of national and international long-term sustainability objectives: (1) the design of procurement processes and PPP arrangements will need to incorporate learning to overcome stability-enforcing mechanisms and increase sustainability; (2) scale flexibility can be embraced proactively to achieve long-term sustainability objectives satisfactorily; (3) governments will need to prioritize potentially conflicting, long-term objectives and define sustainability within tender award criteria to ensure successful implementation.

CRediT authorship contribution statement

Wieke D. Pot: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft, Writing - review & editing, Visualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jclepro.2020.124475>.

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