

## Integrating flood management and sustainable energy

*Lessons from five attempts to realize multifunctional Energy Dams*

### Introducing the case Oosterscheldekering

#### 1. Introduction

In 2008 consultancy firm Ecofys and turbine constructor Tocado both took the initiative to install tidal turbines in the Oosterscheldekering (Eastern Scheldt storm surge barrier). The Oosterscheldekering is the largest of thirteen so called delta works in the south west of The Netherlands. The delta works are built after a flood in 1953, to protect the Netherland from the North Sea. The Oosterscheldekering was initially designed as a fully closed dam but after public protest, the dam is constructed with openings. This way, the saltwater marine life behind the dam is preserved, the estuarine dynamics are preserved and fishing can continue. Now, if there is a risk for flooding, the openings are closed. Tocado and Ecofys applied for a permit to install turbines to generate tidal energy in two of these openings. In 2012 Ecofys sold its project to off-shore construction firm IHC, in 2014 IHC on their turn sold the project to



Tocado, meaning that Tocado now owns both two initiatives. The first will be realised in the summer of 2015. Tocado's primary goal is creating a show case for potential customers of tidal energy turbines.

#### 2. Two private initiatives with extensive public support

The Oosterscheldekering lies in the province of Zeeland. The government of this province is an enthusiastic advocate and promoter of tidal energy. The region is worldwide known for its innovative delta works. The provincial government now hopes to 'update' this status by combining the water works with innovative sustainable energy generation. Zeeland hopes to become the home for the tidal

energy industry and expects much financial and social spin-off for the region. Since 2006 Ecofys operates a small turbine installation, called C-Energy, at a jetty in the Westerschelde in Zeeland. The Province of Zeeland has been involved with this project in different ways. It granted the necessary permit, made a financial contribution and regularly visits the site with international visitors and other guests. The positive experience with this project made the provincial government decide to also contribute to the project Ecofys intended to realize in the Oosterscheldekering.

In 2008 Ecofys and Tocado approached Rijkswaterstaat (RWS), the national Department of Waterways and Public Works. RWS acts as the asset manager of the Oosterscheldekering and is responsible for granting the necessary permits. RWS has the ambition to contribute to sustainability, technology development and sustainable energy innovation in the Netherlands. Therefore, RWS decided to cooperate with the firms and help them to come to a viable permit application. This is necessary because the projects are no 'business as usual'. Nothing similar has done before in the Netherlands. Laws and regulations, such as the spatial planning acts and permit assessment criteria, are not fit for the innovative private plans. What followed, are three years of intensive consultations between RWS and the firms.

For RWS safety is the first priority and the organization sets high requirements concerning safety. RWS wants the private firms to constantly monitor the environmental impact of the installation and demands that it must be possible to take the installation out of the water within minutes if the water level is high. At the same time RWS realizes that when they set the requirements too high, firms will not be able to meet these criteria, financially or technically, and as a result the projects will not succeed. In a quite intensive, but collaborative process the private firms and the asset manager came to an agreement about the terms and conditions under which the firms can install their installations and generate energy at the dam. In 2010 both initiatives got a provisional permit. Because the applicants didn't have the necessary funds to conduct all the necessary research test yet, the provisional permit serves as a temporary solution. To find private investors the initiators needed this permit. The provisional permit enables them to find financial means to conduct the research necessary for the final application.

Both projects will get a SDE subsidy, a public subsidy in the form of a granted financial contribution for every megawatt of generated sustainable energy. In 2010 Ecofys is also granted 5,5 million euro from the EU, the Province of Zeeland and the national government. This is 60 percent of the estimated total costs for realisation. 60 percent is the maximum percentage allowed by the rules concerning state aid.

### **3. Outcomes**

Up to now (end 2014) the projects haven't been realized. Because the revenues of the projects are uncertain, the initiators have a hard time finding the necessary private investors. A project like this is never been realised before, is it uncertain how much energy exactly can be generated. This also has consequences for the search of a buyer for the energy. Because the private initiators cannot guarantee a constant flow of energy, energy cooperatives and other potential buyers are hesitant to make a deal.

In 2012 Ecofys sold their turbine technology, the project in the Oosterscheldekering and the public subsidy to off-shore construction firm IHC. In 2014 IHC on their turn sold the technology, project and subsidy to Tocardo. This means that Tocardo since then owns both two initiatives.

Stimulus, the organization that manages the subsidy program, has accepted the changes in ownership of the grant and the continuing delay of the project. Stimulus sees the project in de Oosterscheldekering as one of their finest and hopes very much that it will be realized. 2015 is the last year however that the money can be spend, than the subsidy program ends and any unspent money will go back to the EU. Therefore, Stimulus set a deadline and stated that if Tocardo did not start preparing the installation in the end of 2014, it would withdraw the subsidy so that another project can profit from the EU money. Tocardo will first realize the project it initiated itself. In the summer of 2015 it will install turbines the firm worked with before and use the EU money that should be spent in this year. It is still uncertain if Tocardo will also realize the second project, using the turbine technology it acquired from IHC.

## **Observations and lessons learned from the Oosterschelde case**

### **Initiative and coalition building**

In this case, in contrast to other Dutch cases, the initiative clearly lies with the private firms. As a consequence, there is less 'role confusion' between private and public actors about who is owner of the initiative. The involved governments support the initiatives but doesn't raise any 'false' expectations by initiating things. Therefore the private firms know that it is their own responsibility to realize the projects.

We can see in this case that private initiators can benefit from successful prior projects. If public actors are satisfied about past projects, they will have less restrains and are more willing to cooperate. In this case, it showed beneficial that the people involved already knew and trusted each other from a smaller and less complex pilot project, the project C-Energy in the Westerschelde.

Combining energy generation and water safety is unique and the standard application procedures and criteria normally don't fit. Applicant and licensor have to negotiate about what is feasible and acceptable for both of them. Customization and making tailor-made agreements is essential. Often, politicians or directors have to step up for the initiatives and make sure that bureaucratic obstacles can be bypassed. Related to this, a positive and flexible attitude of all public actors involved, is indispensable. Subsidy and permit grantors have to accept that the projects can get delayed and change over time. They have to deal with private actors that come forward with (too) optimistic information about the progress of the projects.

The permit application process is both time and money consuming. In this case, the applicants didn't have the necessary funds to conduct the necessary research. But to find private investors they needed a permit first. A provisional permit now serves as a 'temporary solution', it enables them to find financial means to conduct the research necessary for the final application.

It can be beneficial for different actors to organize stakeholder analyses and information meetings collaboratively, even if concerns and interests differ among the actors. In this case, the two private initiators did a stakeholder analysis in cooperation with asset manager RWS, because it was in their mutual benefit. After that, they staged an information event together with a local environment group, the 'Zeeuwse Milieufederatie'. This group had some concerns about the projects but at the same time saw it as a good alternative for wind mills. It decided to cooperate with the private initiators. This way, local support was created.

### **Defining the business case**

The intended aim and expected benefits of the projects, are different for the involved actors: Stimulus financially supports one of the project on the assumption that their help will benefit technology development, innovation and entrepreneurship. For the private firms, technology development is not their first aim. They consider the installations primarily as 'show case' for potential customers. The Province of Zeeland supports the projects in the hope that other local firms will benefit, that it will attract innovative industry and a lot of visitors. This despite the fact that the installation site will not be accessible. This case shows that different expectations of actors involved is not a hindrance necessarily. It can be beneficial for the realization of project, but the question is what the consequences will be if certain expectations are not met in later phases of the project. Will the public organizations e.g. keep supporting the private initiatives if they don't show the hoped for public benefits?

The asset manager (Rijkswaterstaat) doesn't support the initiatives financially, even though the initiators asked the organisation to do so. RWS does not regard itself responsible for sustainable energy innovation. However, the organisation does have the ambition to stimulate multifunctional use of their water works and it wants to contribute to sustainability and technology development. Therefore RWS cooperates with the private initiators in this case and invests a lot of 'man-hours' in the projects. The application process took three years, and since the granting of the provisional permits, RWS reversed personal capacity to assess the final permit applications.

The safety requirements RWS sets, the fact that it must be possible to take the installation out of the water and the obliged monitoring of the environmental impact, means a lot of extra costs for the private initiators. These procedural obligations make it harder for them to come to a viable business case.

The local government expects great benefit of the project for local business. In the prior C-Energy project local firms were contracted to build the installation and help with unforeseen occurrences. In contrast to other cases, in this case the local government is willing and able to translate these expected 'vague' benefits of the projects, such as growing local employment and favourable image building, into financial contributions / subsidies.

This case shows that governments can support the private initiatives in more ways than with subsidies and flexible permit granting. The Province of Zeeland mediated between the firms and local environmental groups to prevent that the latter would lodge an objection to the projects. The Province made a deal with the groups and met their wishes in current affairs.

Tocado says to regard this project as a pilot for a future larger project in the Oosterscheldekering, but asset manager RWS states that there is absolutely no change that a larger project will be allowed. This can mean that Tocardo is not well enough informed about the intentions of RWS. However, this can also be 'strategic behaviour' of the actors involved. 'Energy from water' develops fast, possibly the actors assume that the standpoint of others will change when conditions change in the future.

### **Arranging collaboration around realization**

In this case the responsible asset manager chooses for 'public stewardship'. After obtaining a permit, the private initiator is allowed to 'co use' the water work. It leases a part of the infrastructure and pays rent to the government organisation that manages the state's real estate (Rijksvastgoedbedrijf).

The two private firms which both initiated a project in the Oosterscheldekering, acted as competitors and partners alternately. When they could benefit from cooperation, for example in the permit application process, they acted together. The public actors in the process, including asset manager RWS, benefited from this. However, when cooperation could harm the competitive position of the two private firms, they acted on their own. This means 'double the work' for the public actors as they e.g. have to do negotiations with both firms separately.

The private initiators look for innovative ways to find financing. Private investors are hesitant to invest in the projects because the precise yields are uncertain. To cover this uncertainty, IHC wanted to take out insurances to cover lower than expected energy revenues and other unforeseen financial setbacks.

Asset manager RWS helps the private initiators to come to a viable business case by changing the time length of the permit. 'Normal' permits are valid for 15 years, in this case RWS granted permits for the coming 20 years.

Local governments paid for publicity activities for the projects. The government benefits from the publicity, the private initiator does not pay for this kind of activities itself. A financial contribution to the realisation does not automatically lead to the beneficial publicity for the government.

### **Exploitation and management**

The exploitation and management of the project will be in the hands of Tocardo and its partners. The firm hopes to become owner operator of the project. Tocardo's shareholder Huisman will build the construction. Tocardo will build the turbines. Partner and building contractor Strukton will be responsible for the management of the project. The obliged monitoring will be subcontracted to knowledge institute Deltares. Besides the public rent for the lease of the water work, Tocardo doesn't expect much costs, it states that after realization 'we will generate energy and recover the investment costs'. The firm hopes to sell the project after a few years, for example to a power company or local energy cooperative. Tocardo actually is a turbine builder (and no project developer) and hopes that in the future it will only sell turbines to other initiators.

Sustainable energy and the innovative techniques appeal to people's imagination and citizens normally are very enthusiast. Therefore, in most projects public and private actors seem to seek as much publicity as possible. This case however shows a different stance. RWS seems slightly reserved with bringing it to public attention. The organisation has asked the private firms to discuss any airing with them at forehand. It is very important for RWS that the people in the region are and feel safe.

**Note**

The various projects are still "under construction" and the planning processes are rather dynamic. This description is completed early 2015. That means that still many aspects are not clear, or still highly changeable.

This description is based upon empirical research of Sanne Grotenbreg (junior researcher).