



WARES PROJECT PUBLICATIONS

Use of the Public-Private Partnership Funding Instrument

in Finland, Norway, Scotland, Northern Ireland and Ireland

Victor Pavlov, Niko Hänninen and Eva Pongrácz



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Innovative funding
in Europe's Northern
Periphery for sustainable
and prosperous future

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Introduction

This report is published within the Water Asset Renewable Energy Solutions (WARES) project. WARES is a two-year strategic project of the Northern Periphery Programme, which explores the opportunities to generate renewable energy at water utility assets. The project is led by the International Resources and Recycling Institute in Scotland, in partnership with Action Renewables in Northern-Ireland, Mayo County Council and Clár-ICH in Ireland, Narvik Science Park and Northern Research Institute in Norway, and the University of Oulu in Finland. The map of the Northern Periphery region and the location of partners is illustrated in the map below.

The aim of WARES is to provide innovative renewable energy solutions to remote areas by finding unused opportunities for renewable energy generation within the activities and property of the

water sector. WARES will establish partnerships between the water industry and neighbouring communities and help sourcing the capital investment required to commercialise these opportunities, such as creating Public Private Partnerships.

This report describes the Public-Private Partnership (PPP) funding instrument. The PPP instrument has become of high interest and relevance in many countries. Currently, it is in use mainly in Western Europe, but the concept is increasingly replicated also in Russia, the United States, Australia, Japan, Malaysia, among others.

This report discusses the concept of PPP in more detail; how it works, types of partnerships, major focus areas, pros and cons. In addition, some examples of renewable energy PPP projects within the water sector in the Northern Periphery are described.



Figure 1. The map of the Northern Periphery region and the location of partners.



1 The concept of Public-Private Partnership

The Public-Private Partnership (PPP) is a recent concept. The first PPP was first used in Europe in the early 1990s, but as can be seen from Table 1, both the number and value of these projects has increased strongly in less than two decades. (UNECE, 2008; Kappeler, et al., 2010)

Table 1. PPP development in Europe (modified from Kappeler, et al., 2010).

Year	Number of projects	Value of projects, millions euro
1990	2	1 386
1995	12	3 264
1996	26	8 488
...
2008	115	24 198
2009	118	15 740

Between 1990-2009 more than 1300 projects were realized in Europe with the investments exceeding 250 billion euro. So far, according to the 2009 data, almost 90% of all European PPP projects were implemented in just five countries. The leading countries, in descending order, are (Kappeler, et al., 2010):

- UK (with 67,1% of total PPP projects share in the EU),
- Spain (with 10,1% of total PPP projects share in the EU),
- France (with 5,4% of total PPP projects share in the EU),
- Germany (with 4,9% of total PPP projects share in the EU),

- Portugal (with 3,1% of total PPP projects share in the EU).

The number of the PPP projects continues to grow. The PPP structures, legislative bases, and names can vary in different countries, but some features are common for all of them. (Kappeler, et al., 2010)

PPP can be defined as a model, where public facilities and services, as the main object of the partnership, benefit from collaboration between public entities and private companies. Within this collaboration, the public facilities and services are funded, designed, implemented and operated by the partners. The latter brings a subsequent positive contribution to the community development where the PPP takes place. Among the range of objects of the partnership there can be public transport infrastructure, municipal buildings and facilities (e.g. educational institutes, hospitals), environment (e.g. air pollution prevention, sewage treatment, solid waste management, renewable energy implementation), recreation and culture, and others. At the moment, the most popular area in the EU for PPP projects is transportation. However, that is not the case in the UK, which is an obvious PPP leader in Europe. The PPPs in the UK mainly focus on education and healthcare development. (Kappeler, et al., 2010; UNECE, 2008)

The main characteristics of PPP are as follows (UNECE, 2008; Kappeler, et al., 2010; AID, 2012):

- Long-term duration of the partnership. It can sometimes last up to 30 years;

- Different funding mechanisms. The PPPs are often funded by the public sector, but also private sector can finance them as well. Sometimes PPS are funded by the customers of the service through user fees (e.g. toll road, water fee, electricity fee, public transport). In addition, PPP makes it possible for the public sector to avoid funding by loan, which is preferable especially for fiscal reasons. These above mentioned issues are few of the main reasons, which have led to the rapid expansion of the PPP model all over the world. The following features make the Public-Private Partnership scheme attractive to apply;
- Risk sharing. As a rule, the public entity tends to transfer all the PPP-related risks towards the private sector. Thus, all the project risks are taken by the project private company or Special Purpose Vehicle. The latter is considered in the text below;
- Know-how and efficiency contribution. The private sector brings know-how, innovation, and expertise to the PPP projects regarding funding, designing, construction, implementation, maintenance, and operation. In addition, all the works are done in more efficient ways in terms of time, material, energy, and money use. The construction and labor capacities are also higher.

In order to understand better how the PPP model works, an operational scheme of the PPP is illustrated in Figure 2.

There are two key players in PPP, which are essential for the whole system: public entity and private company. The public entity is normally represented by a local authority or central government. The public entity is the one in the partnership, who initiates the PPP creation and seeks project partners. The public entity has recognized an object that needs improvement in such areas as municipal transport infrastructure, education, healthcare, environment, recreation and culture, defence, etc. The private company can be any company from the private sector that fits to the profile of the development project and can contribute to it better than other similar companies. The latter is of importance since the public entity usually arranges a tendering process for private companies. The competition is held in order to choose the private company with the best expertise and experience, which suit the specifications of the project. The private company, which wins the tendering process, delivers the project. The public entity grants the private company a concession to realize the project. The next step after the concession is the creation of new, separate entity. When the new company (i.e. project company) or so-called Special Purpose Vehicle is formed, the public entity and the project company sign the Concession Agreement, or the Project Agreement. This serves as an official contract between the two. The Concession Agreement includes the terms and

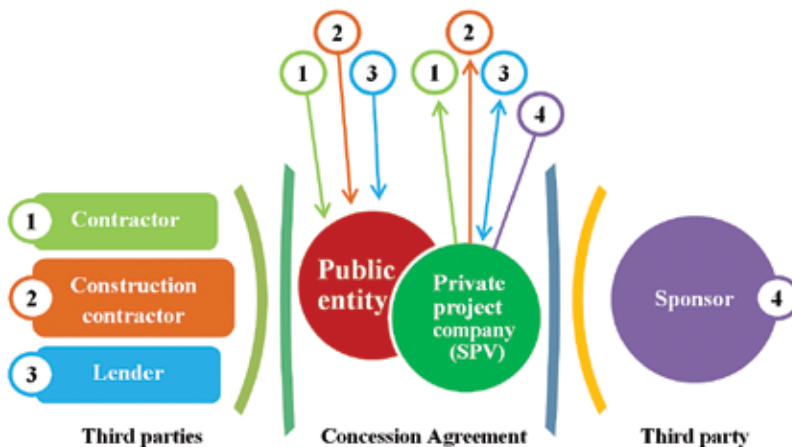


Figure 2. Example of Public-Private Partnership scheme and its principle of operation.

conditions of the project and all the project related risks are allocated to the new-formed project company. The difference between the private company and the project company is the following. The private company won the tendering process organized by the public entity, but the project company, in its turn, is the one who will implement the project ordered by the public entity and receive the money to do that. Project company includes project sponsors and investors, who contribute with a small part of the overall project budget. The project company itself is created to lower the financial risks (e.g. insolvency) for the sponsors in the case the project fails. Thus, the funding for the project, aside from the Public entity contribution, also comes from the private sector where the various players are involved. The project company is linked to the sponsors, as shown with number 4 in Figure 2, and in many cases it is a subsidiary of the sponsors. The sponsors are normally big construction companies or companies responsible for facilities management, who are interested to participate in the project. (AID, 2012; Kappeler, et al., 2010; UNECE, 2008)

The project company actively collaborates with subordinates such as (AID, 2012):

- Different contractors, who are in charge of the services related to the facilities management, and
- Construction contractors that deal with the construction works.

Sometimes subcontractors can be also invited to deliver some other services. All these various contractors are brought under the project company. Correspondingly, they all are independent of the public entity (unless stated in the Concession Agreement). The same goes with the next main player: i.e. lender. The latter is invited to take part in the project as a provider of loans. This is another source of funding for the PPP in addition to the sponsors/investors included in the project company. The lenders (e.g. commercial banks, export credit agencies, other finance institutions) normally enter in the two agreements: i.e. Financing Agreement and Security Agreement. The first one is the agreement about providing loans by lenders

to the project company, the second is the agreement about guarantees towards the lenders. However, despite this, the main cash flow, according to the Concession Agreement, originates from the government, or the public sector. This naturally attracts the private sector to get involved in the PPP. (AID, 2012)

There are several common key principles related to the collaboration between the public entity and the private sector, which define the PPP governance. These are: transparency and openness, fairness of the created and applied rules, resource (funds, time, material) efficiency, responsibility and involvement of the partners. (UNECE, 2008)

The PPP is not just one implementation model, there are several different implementation models. The seven most commonly used models are described in Table 2. The given names of the models are applied worldwide. The differences between the models are explained by the variety of risk sharing and allocation of responsibilities between the public entity and the private sector. (UNECE, 2008)

The advantages of the PPP scheme are long-term duration of the partnership, different funding mechanisms, risk sharing, know-how, and efficiency contribution (AID, 2012; Kappeler, et al., 2010; UNECE, 2008). Additional advantages are (AID, 2012):

- Transfer of the project work. The work is directed by a private project company that has expertise to manage it in the best possible way for most affordable expenses;
- Lower costs and highest value for the money. All the project costs are as low as possible due to the competitive market pricing process.
- Project incentive. The payments are made according to the project work progress and performance. This is a motivating factor and a nice stimulus for the private project company to carry out the tasks faster;
- Immunity to political interference. The projects within the PPP are not exposed to political interference.

In countries where the PPP model is currently implemented, for instance in Russia, following rea-

Table 2. Examples of models of the collaboration between the public entities and the private sector: i.e. Public-Private Partnership models.

Model name	Explanation
Buy-Build-Operate	According to the concession agreement the project company receives the public assets for a certain period of time, improves and operates them until the agreement ends. The public entity can control the public assets during the course of the project
Build-Own-Operate	According to the concession agreement the project company receives and owns the public assets, improves them and operates afterwards. The public entity can set some constraints for the use of public assets in the concession agreement
Build-Own-Operate-Transfer	According to the concession agreement the project company receives and owns the public assets, improves and operates them and has the right to collect user fees for a specified time. Then the public assets are transferred back to the public entity
Build-Operate-Transfer	Similar to the Build-Own-Operate-Transfer model, except that the project company does not have ownership rights
Build-Lease-Operate-Transfer	According to the concession agreement the project company receives and leases the public assets, improves and operates them and has the right to collect user fees for a specified time. Then the public assets are transferred back to the public entity
Design-Build-Finance-Operate	According to the concession agreement the project company gets a long-term lease of the public assets, designs, finances, improves operates them and has the right to collect user fees for a specified time. Then the public assets are transferred back to the public entity
Finance Only	According to the concession agreement the project company finances the public assets project

sons are used to motivate the implementation of the PPP schemes (Gagarin, 2013):

- Availability of more funding to the projects;
- Risk sharing;
- Better planning of the projects expenses in time;
- Higher quality and efficiency for the projects;
- Better relationship between the state and the private sector; and
- Corruption decrease.

For the Russian state, the most attractive advantages are control over the project, access to more funding, and risk allocation to the private sector. In turn, for the private sector the reasons are the following: majority share (51%) in the project, projects are funded by the state and also control over the project. A federal law about the Public-Private Partnership is going to be enacted in Russia. (Gagarin, 2013; Shmeleva, 2014)

The possible disadvantages of the PPP instrument include (AID, 2012):

- Risk of insolvency or large project company profits. If the project company turns insolvent or manages to obtain large profits, it can create political issues for the public entity;
- Higher rates of money borrowing. There are often better offers for the public entities to borrow money alone rather than via the PPP with the project private company;
- Sophisticated contracts with complicated negotiations. Due to the long-term orientation of the PPP projects and a great number of key and main partners involved, the legal matters and negotiations can be rather complex. It can also be linked with high transaction and other costs;

- Long-term period of waiting for benefits out of the project. It is coupled with the long-term duration of the project. Quite many years will pass before profit appears after the project realization.

Regarding water supply and wastewater treatment in the considered countries, there are some examples of PPP projects, which will be discussed in following chapters.





2 PPP in Finland

The concept of the Public-Private Partnership is rather new in Finland. According to Pietilä, et al. (2007) the PPP in its commonly recognizable way does not work in the water sector. However, having the private sector as a partner in municipally owned water companies has been a common feature of water services for years. In Finland, water companies are owned by either municipalities or co-operatives and households. The Finnish legislation does not exclude private water companies, but these are rarely seen. At the same time, through outsourcing, the private companies have been able to operate in water services and actually have been doing so quite extensively. For instance, municipal water companies can outsource or subcontract some tasks to private companies with a short-term (up to three years) contract. The option of long-term contracts is excluded to create a better environment for business competition among smaller private companies. Usually, the municipal water company selects the private company through a tendering process. Detailed design, construction work, wastewater sludge utilization, material and equipment supply, repair workshop services, laboratory analyses, and other smaller services are those activities, which are most commonly outsourced in Finnish water companies. Outsourcing and subcontracting can be quite extensive, they can constitute up to 65% of the total expenses in some water companies. Money is not necessarily the most important reason to utilise subcontractors or to outsource tasks, as smaller companies can have advanced know how, which does not exist even in larger municipal companies. (Mohajeri, et al., 2003; Pietilä, 2006; Pietilä, et al., 2007)

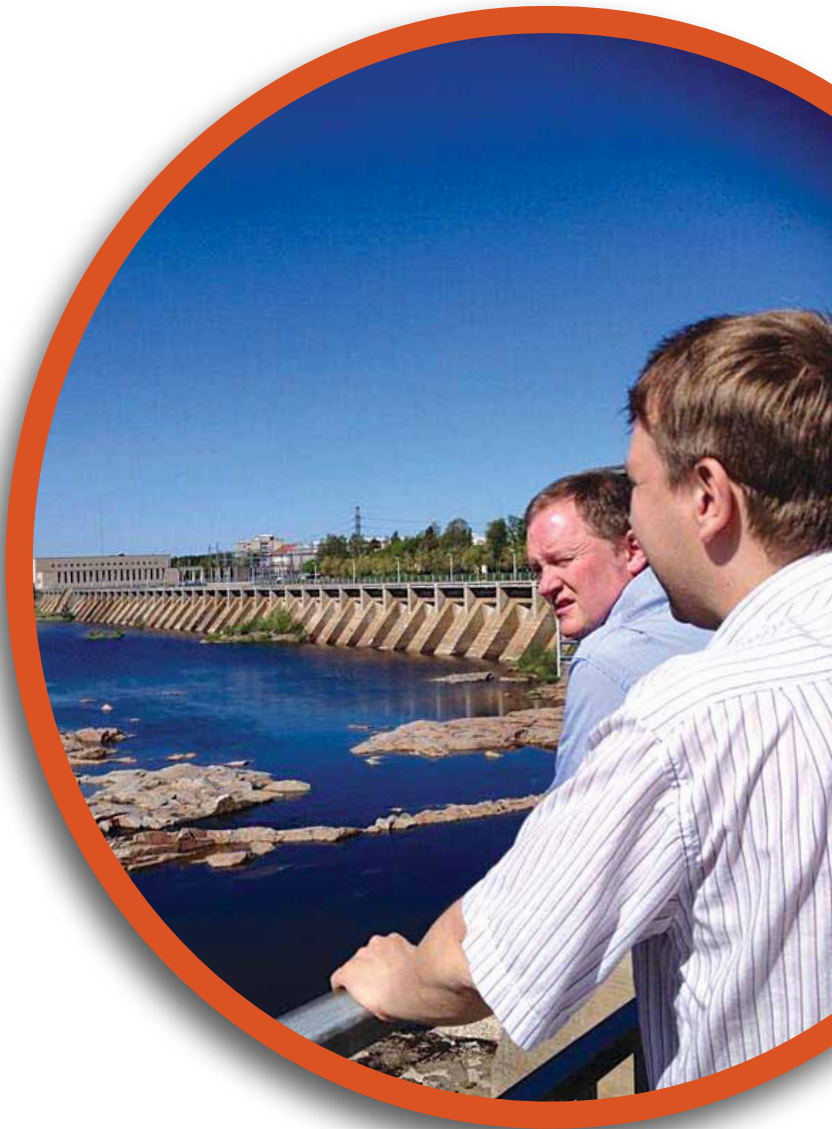
The second largest wastewater treatment plant in Northern Finland, the Haapavesi plant, is a perfect example of the use of PPP in Finnish water utilities. The plant, which can service 60 000 people, was the first water utility in Finland, where PPP concept was utilized. The contract was signed in 2002 and it dealt with refit and operation of a municipally owned sewage treatment facility. The applied PPP model was the Build-Operate-Transfer type. There were several parties involved: the Haapavesi municipality had minority of shareholding and the project company (Special Purpose Vehicle between Kemwater Services Ltd and YIT Environment) had majority shareholding. There was also a third party involved in this PPP, a local dairy (Valio Oy), which sends its wastewater to the treatment plant. The investment of 2 million euro comes from YIT Environment. Kemwater Services Ltd. which brings to the PPP project know-how in wastewater treatment, is responsible for 12 years of operation after commissioning. (Mohajeri, et al., 2003; GWI, 2002)

Another Finnish PPP case was more international in its nature, as it dealt with the improvement of the wastewater treatment system in St. Petersburg. A wastewater treatment plant was built in the South West of the city by this PPP. Finnish and Russian designers took part in the project development, whereas Nordic contractors did the actual construction work. In the framework of the PPP, about 200 million euro was invested in the project. Among the investment mechanisms were, as listed (FWF, 2014b):

- International loans,
- Grants,

- Capital investments, and
- Local financing.

The project was implemented in the Northern Dimension Environmental Partnership programme, which aims to improve the environmental state of the Baltic and the Barents Seas. (FWF, 2014b)



3 PPP in Norway

In Norway the concept of PPP is not well-utilized either. There has been some projects since the early 2000s, but they are mostly related to road development, transport sector, defence, education, and healthcare. So far there has not been a single PPP project in the water sector. The main reason, why the Public-Private Partnership is not as developed in Norway than in other countries considered in this report, might be due to the existence of Norwegian oil industry. Norway is one of the wealthiest countries in the world, and it seems that because of this the public entities do not have difficulties in funding their development projects. Therefore, there is no need for the Norwegian government to attract the private sector to take part in these projects. In addition, Norway does not have enough experience in the PPP matters. There is no official policy or legislation about PPP in the country. (Greve, 2003; Semlitsch, 2005; Wright, 2013; TED, 2013)

Within the WARES project, a renewable energy pilot is underway in the municipality of Hemnes in the Norwegian county of Nordland. The Sagelva project focuses on a water supply company that delivers water to domestic users. There are plans to implement a micro-scale hydropower plant on the water asset. The investment is to be done using a PPP mechanism. The public entity are the water asset owner (and land owners) and the private sector partner is Fjellkraft AS. The private company is an expert in small-scale hydropower technology. Within the project a project company is going to be established to implement the project. The capacity of the planned micro-scale hydropower plant is 1,5 MW. The estimated capital costs are 2,2 million euro. The funding originates from the quota obligation support program and private company investments. (Further information from the WARES project website: <http://www.waresnpp.eu/>)



4 PPP in Scotland

While many European countries have just started to implement PPP, the UK is the most experienced in this matter. In 2009 about 67 % of the European PPP projects were carried out in the UK. The UK's priorities in public facilities and services within the scope of Public-Private Partnership are: education, health, public services, environment and transportation. The share of the mentioned areas in 2009 was 35%, 34%, 14%, 6% and 4%, respectively. In terms of the water sector PPP projects, Scotland has a number of projects related to wastewater treatment: e.g. Aberdeen, Tay, Levenmouth, Highland and others. The normal PPP model used is Design-Build-Finance-Operate. (UNECE, 2008; Kappeler, et al., 2010; EBRD, 2005)

To illustrate one of the PPP projects in Scotland, Scottish Water Solutions (SWS) was created in 2002. It was a joint venture organized by Scottish Water Authority. The main objective was to realize an investment program between 2002 and 2006. The subsidiary company (i.e. Scottish Water Solutions) was established to carry out the program. This was the first PPP project of its kind and scale that was implemented in the UK. The shares in the project were 51% and 49% respectively for Scottish Water Authority and for two consortia under Scottish Water Solutions: Stirling Water (24,5%) (Thames Water, MJ Gleeson, KBR and Alfred McAlpine) and UUGM (24,5%) (United Utilities, Galliford Try and Morgan Est). The private project company in this case helped to bring in the PPP project experience in engineering, construction, management and investment delivery. Scottish Water was facilitating the development of water quality and wastewater treatment via support for 1 200 related projects. (EC DGRP, 2004)

Another example of PPP projects in Scotland is in wastewater treatment. The project, named Almond Valley and Seafield project, was dealing with an upgrade of five wastewater treatment plants serving about 600 000 water consumers. The goal was to improve sludge treatment, digestion and drying, odor control and ultraviolet light disinfection of effluent. The project was based on a contract via the Private Finance Initiative. The private project company, Stirling Water (Thames Water, MJ Gleeson and Montgomery Watson), was in charge of the project through the Design-Build-Operate PPP model. The period of operation is 30 years. (EC DGRP, 2004)

Regarding renewable energy implementation within the WARES project, two community pilot projects are to be realized in Evanton and Roybridge (Inverness-shire). The renewable energy solution to be utilized is hydropower. (<http://www.waresnpp.eu/>)



5 PPP in Northern Ireland

There are several examples of PPP projects in Northern Ireland as well. Project Alpha, which started in 2006, is a strategic PPP project with the objective of improving the drinking water quality to meet the EU Drinking Water Directive requirements. Within the project, four existing water treatment facilities and water infrastructures are to be improved. The water system serves about 50% of the population of the country: i.e. around 850 000 people. The partnership was organized between the public entity, Northern Ireland Water, and the private project company, Darliada Water Limited (i.e. Earth Tech Engineering UK, Kelda Group and Farrans Construction). The length of the contract is 25 years, 23 out of which are related to the actual operation of the water treatment facilities by the project company. The used PPP model is Design-Build-Finance-Operate. (Dickinson, et al., 2009; UKWP, 2007)

There is one pilot project to be implemented within the WARES project in Northern Ireland. The Loughmacrory pilot plans to implement solar and wind energy solutions on a land belonging to Northern Ireland Water. Solar panels will be installed on a club building roof of 560m². The estimated solar energy production is 80 kW, and for wind energy – 225 kW. The possible annual energy savings can be up to 2 750 euro and 7 350 euro respectively. The capital cost of the solar panels is projected to be about 86 000 euro. For the wind turbine it is approximately 615 000 euro. The pay-back period for both is expected to be 20 years. (ARNI, 2014; The Money Converter, 2014b)



6 PPP in Ireland

In Ireland, PPP projects have been implemented since 1999. The PPP concept has been applied to public transport, water services, road works, waste management and education. In 2002, the State Authorities (Public Private Partnership) Act 2002 was introduced to provide support for PPP on legislative level. This made it possible for state authorities to participate in PPP. In the same year a special agency was created to advise authorities about PPP issues, in particular, about funding and financial public investment problems. The agency is called National Development Finance Agency. The Irish authorities can consult this organization for advice regarding PPP, especially if the investment costs more than 30 million euros. In addition, there is a network of social partners in Ireland initiated by the government. It includes the Irish Business and Employers Confederation, Congress of Trade Unions, the Construction Industry Federation and other organisations interested in the PPP scheme. All these parties are united within a framework agreement. Their task is to act as an informal advisory group concerning different PPP issues. Public-Private Partnership is currently applied on a continuous basis. There are PPP projects in wastewater treatment, housing and transport issues. As a part of the PPP scheme implementation support in Ireland, there is a website, which provides guidance documentation, tools for PPP project proposals evaluation and other useful information. It is organized by Central PPP Unit of Department of Finance. (Robles, 2009)

To support the PPP development in Ireland, the following measures have been taken (Mohajeri, et al., 2003):

- Organization of an informal advisory group, Interdepartmental Group and cabinet committee about PPP matters;
- Organization of special units at Department of Finance, Department of the Environment and Local Government, Department of Health and the National Roads Authority;
- Organization of the PPP Fund for the projects non-eligible for the main investment programmes;
- Organization of the Complete Information System and the Local Authority Financial Accounting System;
- State Authorities (PPP Arrangements) Bill 2001, as new PPP related regulation;
- Framework agreement with social partners;
- Training courses and seminars at three levels.

Areas of potential PPP application in the water sector include wastewater treatment, water supply, rural water supply improvement, group drainage wastewater facilities, water treatment development and operation, renovation of water infrastructure, etc. Design-Build and Design-Build-Operate. are examples of PPP models, which have been used in Ireland. (Mohajeri, et al., 2003)

Dublin Region Waste Water Scheme (Treatment plant), which was established in 1999, is one of the earliest PPP projects in the water sector in Ireland. The aim of the PPP was to build a new plant using the best available technologies and expertise. The plant was designed to provide wastewater treatment for commercial and domestic users in the Greater Dublin Area. The partnership was organized between Dublin Municipality, Water Authority and Private International Consortium on the Design-Build-Operate PPP model. During the 20-

year period of operation the contractor can charge fees from non-domestic customers. The latter covers the capital costs and the costs related to operation and maintenance. The source of funding originates from Heritage and Local Government, an EU Grant from the EU Cohesion Fund, the Department of the Environment, Dublin City Council and non-domestic users. Half of the funding was provided by the EU Cohesion Fund. The project started in 1999 and the wastewater treatment plant was completed in 2003. (EC DGRP, 2004; DKM, 2012)

There are several renewable energy pilot projects planned within WARES in Ireland. Two of the projects are related to the Group Water Schemes. One of them, in Killaturley, would utilize solar energy in a Group Water Schemes, which serves 400 domestic users. After implementation of the project, it will be possible to gain energy savings. A 25 kW solar panel would be installed, which costs about 52 000 euro, in order save energy. The payback period is 17 years. The other one, in Kilmeena, serves the same number of households and also plans to install solar photovoltaic panels totaling 8 kW capacity. The estimated capital cost is around 17 000 euro. The time to recover return on investments is 13 years. There are also other pilot projects: Achill Island central, Achill Regional, Erris Pumping Station, Lahardaun, Lisglennon, Lough Mask Schem

and Mayo Abbey. The prioritized renewable energy technologies are wind energy, solar PV energy and hydropower. In the Achill Island Central project two technologies are installed. Solar panels (10 kW) and a wind turbine (20 kW) will provide electricity for a wastewater treatment plant serving 4 000 people. The capital cost for the solar energy solution is 17 000 euro, whereas the wind turbine option investment requirement is 100 000 euro. The projected production of energy is 9 MWh from the solar panels and 76 MWh from the wind turbine. The payback periods are about 12 and 8 years respectively. In the Archill Island Regional project hydropower and wind energy are used as primary renewable energy solutions. One technology, which is not that common, is to be utilised in the Lough Mask Regional project. This utilises in-pipe hydropower technology, which produces 14 kW. It converts energy of running water inside the pipe (with up to 1,4 m/s flow rate) into electricity. The expected energy production is 120 MWh. The return of the 70 000 euro investment is calculated to be in 5 years. All these projects are funded using the PPP model. Irish Water, in particular, also provides some financial support for the projects. (MCCI, 2014)

7 Summary

The Public-Private Partnership instrument is widely utilized by the water sector in Ireland, Scotland and Northern Ireland. (UNECE, 2008; Dickinson, et al., 2009; Robles, 2009) Regarding water asset utilization for renewable energy generation, water assets are the most extensively utilized for renewable energy generation in Ireland. In Finland, the PPP instrument is on the rise, while in Norway projects between the public sector and private companies are scarce. The latter is explained mostly by

the availability of state funds to finance the projects, which would otherwise be realized via PPP.

Notwithstanding the differences, in terms of PPP, the trend in Europe is rising. It is expected that PPP will play a more prominent role in the water sector and for renewable energy implementation in the future. (Greve, 2003; Kappeler, et al., 2010)





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WARES (Water Asset Renewable Energy Solutions) is a 2-year Northern Periphery Programme strategic project which explores the opportunities to generate renewable energy at water utility assets. The focus is on sites with previously unused, hidden potential. The outcomes of the project will be used to propose a scheme of policy refinements for each region. The project is implemented during 2012-2014.

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