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Renewable Energy Regions
8th Newsletter

NEWS

August 2022

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RegEnergy Findings

The Idea

Renewable energy partnerships create a win-win situation between rural supply and urban demand:

- ➔ Urban consumers meet their renewable energy demands from reliable regional supplies.
- ➔ Rural renewable energy producers get access to urban consumers.
- ➔ The region as a whole, benefits from increased interactions, investments in energy and other infrastructure. By pooling financial and professional resources in the region, a growth impulse can be created.

BACKGROUND

Renewable energy partnerships - urban demand & rural supply

Urban areas, especially in North-West Europe, have the highest energy consumption in the European Union and are still dependant substantially on non-renewable energy sources. To reach the emission reduction targets, regions need to balance their energy demand with the supply of renewable energy locally. Hence, urban areas, as heavy energy consumers without significant renewable energy production potential, need to partner with surrounding rural areas to reliably meet their energy needs in the future. Rural areas usually have large capacities to offer renewable energy production, but limited energy consumption.





Step by Step - Establishing Renewable Energy Partnerships



PHASE 1

Getting started - Analyse the background and establish a partnership

The goal of phase 1 is to create a joint vision, to define specific targets for your renewable energy region and to get the relevant stakeholders on board. In this phase the following steps form an iterative process towards defining your partnership:

- Analyse the status-quo – What is the strength of your region? Which potentials for renewable energy production exist? What is the demand?
- Understand the background – What are the legal, institutional and market relevant factors that need to be considered?
- Develop the partnership – Who are the relevant supporters? Who needs to be involved?
- Check options to match supply and demand – Which options exist to bring supply and demand together?





IMPLEMENTATION PHASE:

PHASE 2

Challenges & solutions - Find practical solutions for existing barriers

Building on the findings so far, the implementation phase aims to establish the partnership legally, technically and economically as well as to anchor it socially. Identified challenges need to be overcome by finding creative, innovative solutions for your urban-rural partnership. Challenges can arise regarding different aspects of partnerships implementation. Mostly they need to be tackled in parallel, considering the following aspects.

1. Find creative solutions within the given framework
2. Manage renewable energy supply and demand
3. Increase acceptance with public involvement



OPERATIONAL PHASE

PHASE 3

Monitor, share and adapt - Monitor and share your experiences

After implementation, your renewable energy partnerships need to be continuously monitored. By putting standardised reporting and monitoring procedures in place, valuable data can be collected, which supports evaluation. Additionally, direct and honest communication with all cooperating partners should be used to collect experiences and relevant data. The constantly changing legal and economic backgrounds mean that the identified targets as well as the composition of the partnership must be constantly reviewed and adapted.



A guide to establishing renewable energy partnerships

In the brochure “Renewable Energy Regions - A guide to establishing renewable energy partnerships” the experiences of all RegEnergy project partners are summarised. It contains a detailed step-by-step guide, complemented by best practice examples from the partners. The guide is intended to provide valuable support to interested regions in establishing their own renewable energy partnerships.

It is available for download on the RegEnergy website in three languages, German, English and French.



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RegEnergy Highlights

COMMUNITY-OWNED RENEWABLE ENERGY (RE)

URBAN-RURAL PARTNERSHIPS

NET-ZERO CARBON SOCIETY

MULTIFACETED
AGREEMENT

NETWORK FOR RE REGIONS

CONNECTING RE PRODUCERS & CONSUMERS

BIOGAS FROM WASTE WATER

SUPPLY-DEMAND CHAIN FOR BIOMETHANE

SMART PLATFORM

SMART SOLUTIONS FOR RE GROWTH

HIGH DEMAND CONSUMERS

PHOTOVOLTAIC ENERGY & ELECTRIC MOBILITY



Climate Alliance



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Climate Alliance Germany

A nationwide network for renewable energy regions



Strengthen regional cooperation



Overcome regulatory burdens



Establishment of the Region-N network



Background

Climate Alliance supports the transformation of the current German energy supply system towards a renewable, decentralised and citizen-oriented one.

The lack of regional energy coordination structures is identified a major obstacle for the establishment of renewable energy regions. A better connection between urban areas, where the energy demand is high, and surrounding rural areas, where capacities and land is available to produce renewable energy, is required.

In response to this issue, Climate Alliance created Region-N.

Region-N is an initiative gathering German regional stakeholders committed to the regional energy transition - from municipal and regional administration as well as from associations and public service providers and companies.

The goal is for regions to supply themselves 100% from renewables by 2030 and to use their energy-saving potential, thus strengthening climate protection.

Strategy of success and results

- ➔ Better connect urban and rural areas for the development of RE with a precise observation of GHG emissions in both types of areas: Climate Alliance developed its own CO2 monitoring tool, the "Climate Protection Planner"



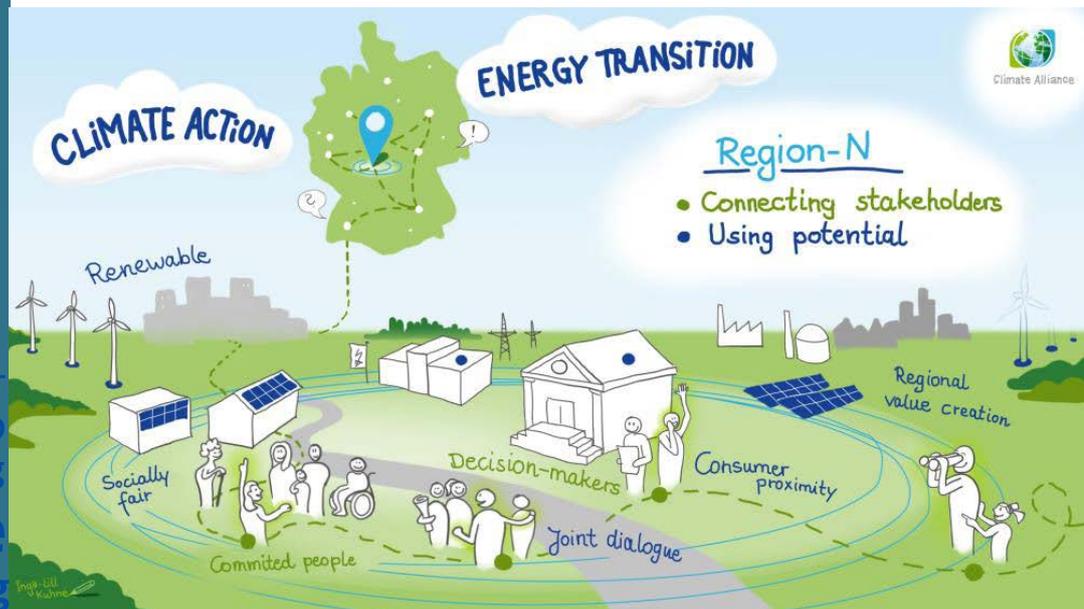


Climate Alliance



- Elaborate a needs analysis: what support and added value offers do regional stakeholders need to accelerate energy transition?
- Develop offers to make the initiative attractive. Region-N offers: an exchange platform for experiences and best practices, small-scale “ready-to-use” campaigns, working groups (e.g. “Photovoltaic on company roofs for power, heat and mobility”, and “Regional heat supply planning”)
- Develop communication tools with relevant contents: elaboration of a quarterly newsletter, creation of a website
- Make the network more independent from public funding by elaborating a business and organisation model (focused on winning districts)
- Organisation of regular events and meetings, like networking events or political networking evenings

For further information visit: www.region-n.net



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Brest métropole France

Multifaceted agreement between city and countryside



Efficient use of resources



Find individual legal solutions



Provide infrastructure
and services



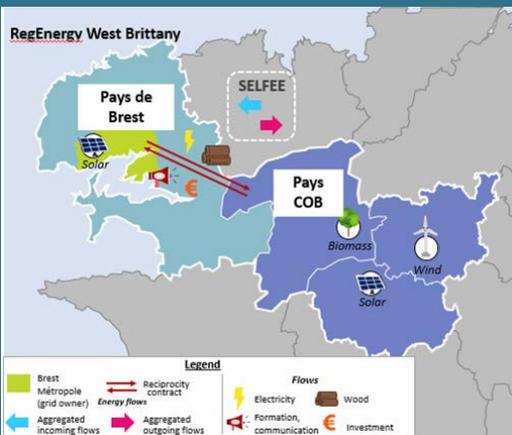
Background

In 2015, France launched an experimental scheme to promote inter-municipal cooperation, called 'city-countryside reciprocity contracts'. The aim is to close the gap between urban and rural areas by promoting win-win partnerships in areas such as the environment and energy transition, or the economic development. The Brest metropolitan area and the country of Central West Brittany represent the first urban-rural partnership to have officially signed a contract in 2016, defining joint workflows for economic development, culture, health, energy and the environment.

The purpose of this territorial project is to develop a local strategy to address the global climate challenge. It defines objectives, an action program and coordinates the involvement of all actors.

Wood energy: Brest Métropole is developing projects on wood-fired heating and heating networks, fuelled by wood from the forestry sector in COB. This reduces COB's dependence on fuel oil, increases the demand for wood and is structuring the wood industry.

Photovoltaic energy: The RegEnergy project provides investment support for projects in urban area and engineering support in rural area. A communication strategy has also been implemented around a solar cadastre.



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Wind farms: There is a strong potential for wind energy and ongoing projects in the Community of Communes of Kreiz Breizh (CCKB). Brest Métropole directly supports the municipalities in taking part into the governance of wind farms by taking a financial stake and by encouraging citizen financing.

Strategy of success and results

URBAN-RURAL CONTRACTS ACROSS ADMINISTRATIVE BOUNDARIES

- Establish new forms of inter-municipal collaboration and to overcome the institutional and administrative barriers.
- Link the production of RE in rural areas with the consumption of heat and electricity of buildings in urban areas.
- Use contractual and financial agreements between the urban consumers and the local and regionally centralized electricity producers of the rural territory.
- Achieve the region as a regional “prosumer” involving regionally centralised and decentralised production and consumption.
- Work together across administrative boundaries. Help the territories to operationalize their cooperation by conducting concrete actions regarding RE production and the joint use of technology and know-how

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Flux50 Belgium

Reliable supply for high demand consumers



Understand energy flows



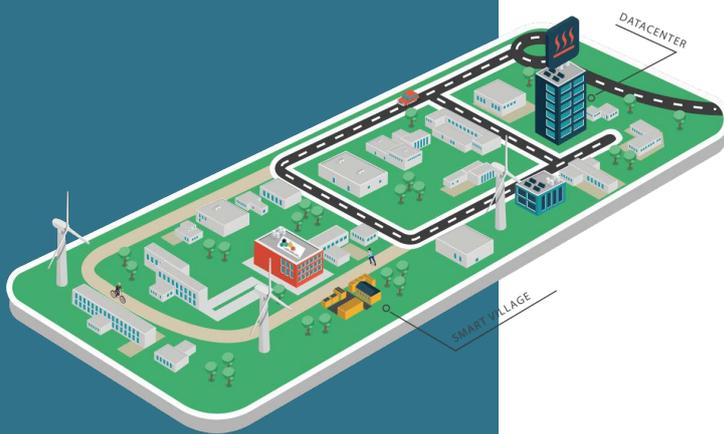
Data as base for efficiency



The Green Energy Park



Background



The Green Energy Park (GEP) in Zellik, Flanders aims at facilitating renewable energy to cover the electric and thermal demand of over 70 companies, a data centre and a nearby residential area. The GEP is equipped by a large electric grid and will be equipped with a low temperature thermal grid.

The energy production from the local companies needs to be engaged, collected and modelled in order to balance the supply and demand within the microgrid of the GEP. The research park targets a CO2 neutral multi-energy balance of production and consumption within a bi-directional grid.

A Smart Village Lab is used to monitor the interaction of photovoltaic-collectors, e-mobility charging stations and supporting storage systems on small scale to further optimise self-consumption and grid stability of the GEP.

The project tries to overcome technical challenges in order to make microgrids environmentally and economically interesting for companies.



Strategy of success and results

- Excess heat from the data centre, heat pumps, cogenerations and different renewable energy sources will be added to the grid.
- The homes can exchange electrical (and thermal) energy via a smart energy grid.
- Energy is stored in multiple batteries, electrical cars and heat buffers.
- The battery systems allow stabilising the grid and optimise self-consumption.
- A wide range of stakeholders interacts (industry, residential).
- The Green Data Centre is under construction and will support GEP with the computing power needed to develop sustainable, high-tech solutions.

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Plymouth City Council United Kingdom

Community-owned renewable energy



Transition on local scale



Limited interaction



Attractive energy communities



Background

Plymouth City Council has established an independent community energy organisation (Plymouth Energy Community), that is developing new approaches to local energy generation, ownership and use.

Two rural energy communities have engaged in solar projects from which profits go back to support the community. Cooperation between rural producers of electricity and consumers within cities profit from the available land for PV-installations in the countryside. The project further supports the use of battery storage and smart metering and also tackles the hurdle of selling electricity by private wire.

Currently the energy market in the UK is undergoing a phase of innovation and reform. In order to develop partnerships, contracts such as power purchase agreements or synthetic power purchase agreements with urban customers were explored in the framework of the cooperation between solar farms and large scale consumers.

Strategy of success and results

- ➔ The development of new business models for the use of renewable energy is crucial for overcoming market constraints.



© by Plymouth Energy Community



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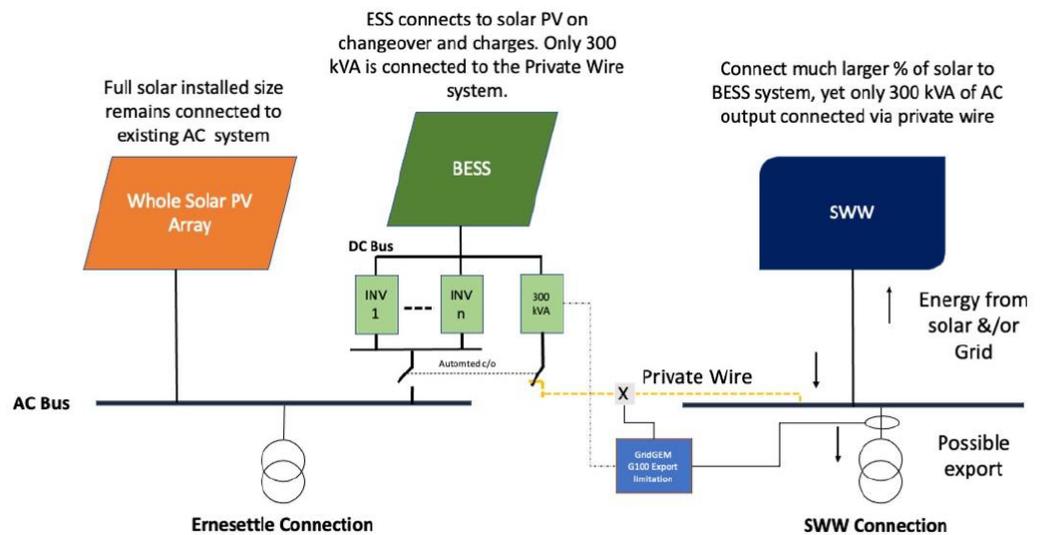
- Investments in new renewable energy schemes such as PV can be secured with the signing of Power Purchase Agreements between local authorities and solar companies.
- Battery storage systems and independent private wires have been shown to provide benefits to the local grid as well as providing opportunities for maximising incomes for local organisations.
- There is improved acceptance of rural renewable energy projects when benefits are provided to local community organisations.

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Waterstromen Etten Netherlands

Biogas from waste water supplies industrial consumer



The value of waste products



A question of permission



Biogas extraction



Background

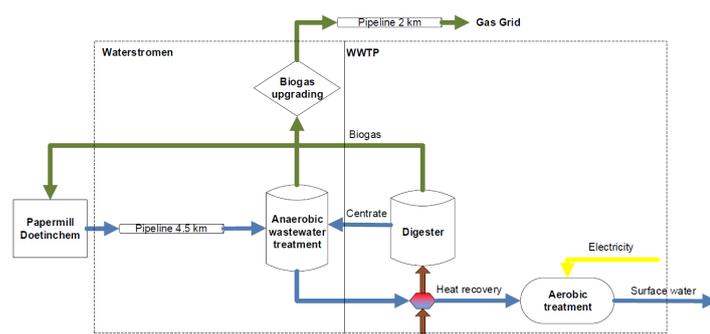
Doetinchem is a city located in the Province of Gelderland, in eastern Netherlands, which comprises around 60,000 inhabitants. A paper mill is situated in the centre of Doetinchem, producing annually more than 1 million cubic metres carbon rich water as a by-product. This water is currently transported together with communal wastewater from Doetinchem city over a distance of 5 km to the waste water treatment plant (WWTP), located in the rural surroundings of the city.

In the WWTP a considerable amount of electricity is needed for the treatment of the industrial water.

As a consequence, the questions arose as to whether it was not possible to produce biogas instead and supply it to the paper mill and further households.



© by Climate Alliance





Strategy of success and results

- Piping is realized between the paper mill and the WWTP for transporting the water from the paper mill separate from the communal waste water to the WWTP location
- Biogas produced in the anaerobic treatment installation and biogas from the existing sludge digestion installation at the WWTP is supplied to the paper mill and to households.
- To make it possible to supply biogas to households a biogas upgrading unit is realised in which biogas is converted to biomethane. A connection to the natural grid is realized to inject the biomethane in the natural grid.
- By producing biogas instead of using electricity and using the biogas as alternative for natural gas a total saving of 2,300 tons of CO2 per year is realized, representing the natural gas consumption of around 1,000 households per year.



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3 Counties Energy Agency Ireland

Towards a net-zero carbon society



Use available potential



Working with a 2-fold approach



Utilizing biomethane

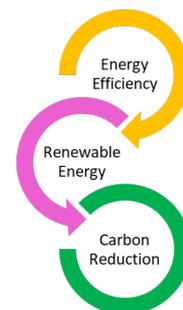


Background

3 Counties Energy Agency (3cea) supports counties to reduce their CO₂ emissions in the field of renewable energy. Analysis for the counties Kilkenny, Carlow and Wexford show an accumulation of greenhouse gases in the agriculture sector. Over 35 % of Irish national emissions lay in this field and are expected to increase further.

Studies on the legal context, regional setting, challenges and opportunities for renewable energy partnerships conduct valuable information on adjustment. Since South-East Ireland is a predominantly rural region, the potential to reduce GHG emissions with bioenergy from agricultural land, forestry, and waste residues is significant.

3cea made use of this potential by establishing a partnership with the public customers to identify a number of sites that could use upgraded biogas (bio-methane) as a sustainable solution for energy supply. The provision of biomethane for gas fuelled heating boilers was carried out by Ormonde Upgrading.



© by 3cea



Strategy of success and results

- 2-fold approach: energy inefficiencies in built environment must be eliminated and renewable energy technology must be used wherever possible.
- Assessments of the renewable energy production and consumption within the 3 counties area allows to optimise the connection between rurally produced energy and urban consumers.
- A machinery yard and a fire station in the towns of Kilkenny and Wexford are currently supplied with biomethane.
- Selection of sites with high visibility for the public fosters the understanding for the decarbonisation of the gas grid.
- Monitoring and Reporting are crucial for a successful implementation and maintenance of the energy transition.

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Planair Switzerland

Interconnect photovoltaic energy and electric mobility



Use technological synergies



Independency of microgrids



The SunnYparc business park



Background

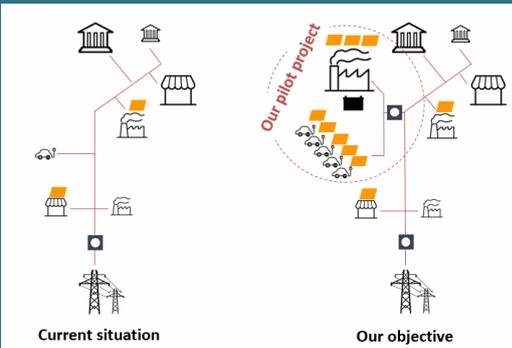
The Swiss policy of self-consumption, in conjunction with the ongoing developments of e-mobility (Vehicle to Grid), offers a unique opportunity to develop business models for the coordinated use of photovoltaic (PV) and electric mobility.

In 2021, 22.5% of new vehicle matriculation in Switzerland are electric (BEV and PHEV) and the country expects that electric vehicles will represent 37% of all cars in 2035.

To foster the use of renewable energy, the city of Yverdon-les-Bains implemented in 2015 its two first public charging stations for electric vehicles, in addition to the private charging station of a technology park called YPARC.

The local DSO is studying the opportunity presented by the large-scale deployment of electric vehicles at a point on the grid for the optimised integration of photovoltaic production.

The aim? To enable people in remote rural and urban areas to intelligently and flexibly charge their electric vehicles with locally produced, low-cost solar energy with V2G capacities.



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Strategy of success and results

- Initiation of the pilot and demonstration project SunnYparc to test in a real context and on a large scale the impacts of a large joint increase in photovoltaic production and in electricity needs for mobility
- Elaboration of a theoretical study on the role of stationary and mobile storage in integrating high photo-voltaic shares in a microgrid to balance supply and demand.
- Elaboration of a study on the impact of V2G on the ageing of electric vehicle batteries.
- Elaboration of business models completed by a survey of Y-PARC users analysing the potential for the deployment of electric vehicles and particularly V2G on the Swiss technology park site.
- Elaboration of a further project : SunnYparc is a microgrid demonstrator integrating the future shared parking of YPARC. This microgrid includes a local production with photovoltaic solar energy (1,3 MW), a stationary storage system (400 kWh), 5 office buildings, 250 charging stations including 50 bidirectional and an innovative microgrid management system.

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Walton Institute of Waterford Institute of Technology, Ireland

A smart platform to optimise supply and demand



Understand the system



Work together with
policy makers



Optimise consumption



Background

In the rural Dingle area, on the western coast of Ireland, industries and offices of the regional authority Údarás na Gaeltachta add up to a substantial electricity consumption.

To facilitate the integration of renewable energy at these distributed sites, innovative smart grid processes and a legislative framework are necessary, enabling the regional actors to function as Energy Communities and take control of their energy use as prosumers.

The energy industry is going through a paradigm shift from a unidirectional, demand driven model with large centralised power generation to a market driven by smart grid concepts where supply and demand will be balanced with variable and intermittent renewable energies in a more regionalised manner.

The Walton Institute of Waterford Institute of Technology designed a software platform to optimise renewable energy production, battery storage and consumption with variable market prices.

Strategy of success and results

- Development of an optimisation platform, coordination of the implementation of smart grid technologies with the potential of being the hub of energy clusters.

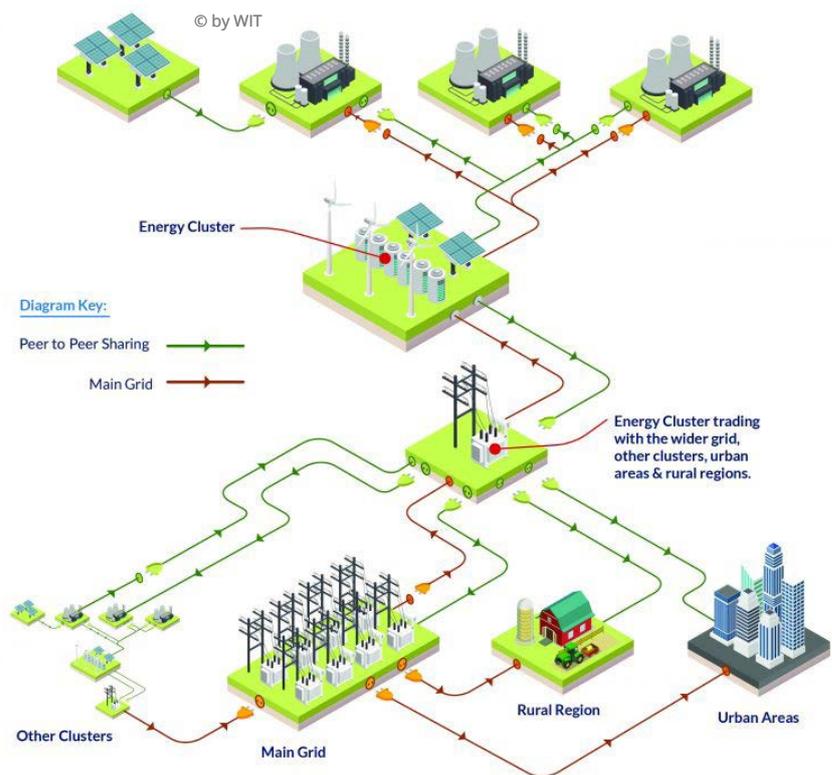


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- Renewable energy clusters such as the UnG offices and industries can act like micro grids, trade with each other and eventually roll up to a regional and then national level to form the smart grid.
- Networks are based on distributed, local generation resources such as solar, wind and battery storage which can be shared in a peer to peer environment, allowing the integration of renewable energy in local communities.
- Energy clusters help to improve regions security of supply, reduce carbon footprint and give the opportunity for energy consumers to control their energy use and become 'prosumers'.
- Clusters can ultimately then trade with the surrounding rural region, urban areas and other clusters.



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Ormonde Upgrading Limited Ireland

Build a supply-demand chain for biomethane



An upgrade to fossil fuels



Lower burdens in
implementation



Biomethane off the grid



Background

The Sustainable Energy Authority of Ireland estimates that biogas has the potential to displace up to 26.3 % of the national natural gas consumption by 2035. Even though the use of biomethane can contribute to decarbonisation and energy safety, the biogas/ biomethane industry in Ireland is underdeveloped. Its integration to the Irish gas grid faces challenges. The injection of biogas and its upgraded version biomethane into the existing grid is expensive and the authorisation process complex.

Ormonde Upgrading Limited developed an alternative off-grid system supply-demand chain to unlock the potential of biomethane and overcome grid related challenges.

The local off-grid partnership delivers biomethane from the producer Ormonde Upgrading, directly to its customers using special transportation and storage equipment thus providing its customers with access to renewable energy.

Strategy of success and results

- ➔ Purification of biogas to make it available to users as biomethane
- ➔ Supply of RE partners with a direct substitute for natural fossil gas



© by Ormonde Upgrading Limited



- Viable off-grid solution: use of specialist gas transportation and storage equipment
- Successful implementation of partnerships between consumers of natural fossil gas and producers of biogas
- Raise awareness and enhance the confidence of consumers in urban settlements in the ability of biomethane to meet their energy needs
- The new value chain for currently unused farm residues (manure, slurry) and other biomass (organic waste, surplus grass/crops) can help in reducing GHG emissions for the farm sector in Ireland.



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 Limited**
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News

May 2022

3cea and Ormonde Organics

Video

3cea released a video with RegEnergy partner Ormonde Organics discussing their actions in the RegEnergy project and how they are delivering biomethane to the southeast region.



August 2022

3cea

Publications

3cea has three papers coming out related to the RegEnergy project over the coming months.

Transmission Network Study

Through the RegEnergy project, 3cea commissioned MullanGrid Consulting to review the European Union (EU) and Irish Government policies surrounding transmission networks. This study targets supporting decarbonisation and the development of renewable



energy and includes an analysis of the existing and planned transmission and generation assets in the South-East region.

Bioenergy Implementation Plan

Through the RegEnergy Project, 3cea commissioned XD Consulting to develop a bioenergy implementation plan for the southeast region of Ireland. The Bioenergy Implementation Plan is intended to be used as a framework document for all participants in the bioenergy sector – producers and growers of raw materials, suppliers of technology and fuels, and all energy consumers.

3cea will be hosting a workshop in the Rivercourt Hotel, Kilkenny for both these on August 25th if you're interested in joining please email Colin Healy in 3cea at chealy@3cea.ie. The two workshops are from 10 am to 12 pm (Bioenergy Implementation Plan) and from 2 pm to 4 pm (Transmission Network Study).

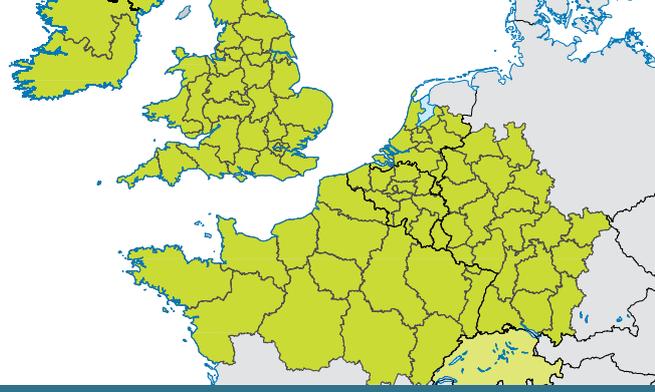
Assessment of the RE Gas Potential and the Development of Bio-CNG in the South-East of Ireland

3cea was commissioned by Gas Networks Ireland to assess the current biogas situation in the southeast of Ireland and the potential biogas holds to meet part of the energy demand in the region. Through this study, we look at the local, national, and global context for biogas in terms of policy and fuel shortages, as well as propose a potential route to market for biogasses in the southeast of Ireland.

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Facts & Figures

The Partnership

- Climate Alliance (Lead Partner, DE)
- Brest Métropole (FR)
- Flux50 (BE)
- Plymouth City Council (UK)
- Waterstromen Etten BV (NL)
- 3 Counties Energy Agency (IE)
- Planair (CH)
- Walton Institute of Waterford Institute of Technology (IE)
- Ormonde Upgrading Limited (IE)

Project Facts

- Duration:
October 2018 – September 2022
- Funding:
€11.08 million total project funding
€6.1 million funded via ERDF

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