

FlexiGrid

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Target group analysis

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Version History

Version	Date	Modifications made by
1	Feb 2020	Mats Tiborn

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List of abbreviations

Abbreviation	Definition
FlexiGrid	Enabling flexibility for future distribution grid – FlexiGrid
DSO	Distribution system operator
TSO	Transmission system operator
ISGAN	International Smart Grid Action Network
NESTNet	NSERC Energy Storage Technology Network
EIB	European Investment Bank
ACER	Agency for the Cooperation of Energy Regulators
IEA	International Energy Agency

Introduction

The work package 10 is designed in mainly three steps with the target group analysis as the starting point. The target group analysis, deliverable D 10.1, is the fundament of the project's communication strategy, deliverable 10.2. To make sure the communication activities within the project, deliverable 10.3, are tailored to reach our target groups, they first need to be defined and analysed. The analysis is then used as a base to create communication activities from. Our target groups are defined to fulfil the overall objectives of the FlexiGrid projects, that are related to market implementation and societal impact of the knowledge and technology that comes out of FlexiGrid.

Objectives to reach with communication

Deliverable 10.1 is the first step in the work package 10. WP10 will support mainly two objectives within FlexiGrid.

- To drive cooperation between distribution system operators (DSOs), transmission system operators (TSOs), consumers and generators
- To enable future technical and commercial innovation

FlexiGrid has a very clear ambition to reach impact on the market and enable renewable energy in Europe's power grids.

Goals

FlexiGrid aims to use communication activities to reach stakeholders and others that are potential game changers for the smart power grids of the future. By creating a dialogue with our target groups we will pave the way for the innovations created in the project to make real impact on society in the form of new technology, new business models, new ways of trading with electricity and in the end facilitate the large-scale breakthrough of renewable energy sources in Europe and around the world.

Our aim with the project's communication is to, by reaching the right audience, spreading the knowledge that will be created within the FlexiGrid project, creating an understanding regarding the benefit of it and a realization of the necessity of smart and flexible power grids. We also aim at getting the target groups to embrace our created knowledge and make decisions for the viability, scaling and replication of the knowledge that will spring from the project.

Target groups

FlexiGrid has detected four main target groups that are important to reach to make impact on a larger scale.

The target groups are:

- Distribution system operators, DSOs and other actors in the grid, such as TSOs, industries and building owners.
- End-users of the power grids, citizens around the targeted DSOs.
- Long-term investors.
- Policy makers.

Additionally, we also count the participators of the FlexiGrid project as an important target group to keep the participants engaged and informed. This is of utter importance for the success of the project.

DSOs

FlexiGrid wants to target the relevant stakeholders that will be responsible or involved in the development of flexibility and retail market options for the distribution grid. FlexiGrid will not only demonstrate solutions, but also look at the scale-up and replication potential. The stakeholder's motivation depends on different possible drivers, such as keeping down the investment for new integrated solutions and at the same time make sure to meet the highly set environmental objectives regarding renewables in the grid (see WP2, WP9 and WP10).

NEED: The DSOs in Europe are profit-driven and need proof that to demonstrate tomorrow's sustainable, cost-effective energy solutions will help them to cut costs, earn more money and/or position themselves as having a sustainable business profile living their brand by acting now. (see WP2).

FlexiGrid provides a context where the stakeholders get first-hand information and knowledge transfer through IRL demonstration activities regarding the integrated solutions with scale-up and replication potential. FlexiGrid provides a replication package (see Grant agreement 2.2.1.6). Thus, providing an opportunity to strengthen their business model, interact and get feed-back from consumers.

Stakeholders are in an excellent position for nudging consumers towards understanding the benefits of the solutions provided by FlexiGrid. This will be encouraged through the project's dissemination activities that are based on the communication strategy.

The local DSOs will need to be informed of the latest news regarding flexibility and retail market options for the distribution grid. FlexiGrid will seek their acceptance and if there is an engagement, this is to be embraced into the project's communication.

FlexiGrid provides comprehensive information about the benefits of the new solutions provided and exactly what needs to be done in order to gain all the benefits.

When the FlexiGrid communication is activated there will be several actors that will have an interest of following the results. They will often be indirectly affected by the progress of the project. This includes

non-participating DSOs, aggregators, service providers, energy suppliers, manufacturers, standardization bodies, distributed generation operators, ISGAN, the scientific community and innovation support providers. This will not only be on a European level but also involve the Canadian network that FlexiGrid reaches through the Collaboration Agreement with its Canadian sister project NESTNet.

Local DSOs

Within FlexiGrid we have a number of partner DSOs. These are located in Bulgaria, Turkey, Sweden and Switzerland. FlexiGrid aims at making impact in society and create change for the better of the European people. Albeit, we realize that being too wide in choosing target groups at the beginning of the roll out of our new technologies will result in inefficient and costly communication activities with impact hard to measure. Instead we will focus on those already related to our project. Therefore our partnering DSOs are important for the work package both as targets groups that have already shown interest for what will come out of FlexiGrid as well as good ambassadors when reaching out to other DSOs.

The DSOs of FlexiGrid are active in four different countries, thus four different contexts with different policy issues, different industry situations, need for flexible solutions and other parameters that have influence on their abilities and needs for new flexible solutions in their power grids. Therefore, a deeper analysis of each location is needed to be able to conduct efficient communication activities.

European DSO associations

GEODE is a member-based network for DSOs and DSO associations, with a particular focus on electricity and gas distribution. GEODE claim to speak with one voice in Europe for the members' interest in the sustainable, efficient and reliable operation of the grids as the backbone of the future energy system (www.geode-eu.org).

European Distribution System Operators (E.DSO) is an interface between Europe's DSOs and the European institutions and promotes the development and large-scale testing of smart grid technologies in real-life situations, new market designs and regulation. E.DSO gathers 44 leading electricity distribution system operators in 25 countries, including 3 national associations, cooperating to ensure the reliability of Europe's electricity supply for consumers and enabling their active participation in our energy system by shaping smarter grids (edsoforsmartgrids.eu).

The Union of the Electricity Industry - Eurelectric is a sector association which represents the common interests of the electricity industry at pan-European level, plus its affiliates and associates on several other continents. They currently have over 34 full members, representing the electricity industry in 32 European countries (<https://www.eurelectric.org/>).

CEDEC is the European Federation of Local Energy Companies, representing the interests of more than 1500 local and regional energy companies - mostly in public hands - serving 85 million electricity and natural gas customers & connections, with an annual turnover of 120 billion € in ten European countries: Austria, Belgium, Bulgaria, France, Germany, Italy, the Netherlands, Norway, Sweden and Switzerland (<http://www.cedec.com/>).

A new EU DSO entity will be created in 2021. It will be responsible for putting in place rules on grid management and use and EU-level cooperation with TSOs. It will also work on the integration of renewables, distributed generation, energy storage, demand response and smart metering systems. The

organization is still in the making and FlexiGrid must stay updated on the development. This document will be updated with information about the DSO Entity in 2021, when it has been launched.

Consumers – the smart prosumers and citizens

FlexiGrid wants to make a knowledge-transfer to the consumers. The reason for this is that the lack of consumer engagement can often be an obstacle for innovation. The consumers want affordable, stable and clean energy and to be perceived as being smart. If they learn that the FlexiGrid solutions make their lives easier, they will share it with friends, family, co-workers to enhance their own image leading to increased acceptance. This part is strongly related to T.10.2 where the consumer engagement planning is integrated in the communication strategy. Here the FlexiGrid DSO's operating the demonstration sites are the main actors for communicating with the end-users and they are to set up a locally adapted smart-citizen plan.

NEED: To prove for themselves and for others that they make smart, cost-effective and/or sustainable choices. People have a tendency to share their success with friends, family, co-workers to enhance their own image. The expected levels of commitment are "understanding" for the local population of areas where the demonstrations take place.

FlexiGrid provides solutions that will make the consumers save money and understand that not only does the energy savings benefit herself/himself, but the local environment as well.

FlexiGrid aims at local acceptance. People should know about the positive effect of the solutions that are demonstrated. They will get this information through interaction with stakeholders (such as building-owners), local media (such as daily newspapers), the city's web pages, etc. Some of the local consumers will not only accept but engage in the outcome of the demonstrated solutions. They will be seeking information, rather than getting it. They will want to show proof of how they save money and energy consumption and how their behaviour contributes to a sustainable world.

European Financial Instruments

EIB and DG Regio

EIB and DG Regio are major financial authorities in regard to flexible systems. To prepare for funding of the achievements of the FlexiGrid project, these are the main authorities to turn to. They are also interested in concrete cases and results that we can provide directly from our demo sites and collaboration within FlexiGrid.

EIB has two focus areas. One is energy investments; this is the world's largest fund for energy solutions. The second focus area is urban development, which also may be of interest to FlexiGrid.

A key person at EIB in Energy investments is Shelley Forrester (s.forrester@eib.org). Within urban development it is Desislava Krалеva (d.krалеva@eib.org). They can help FlexiGrid find the right fund to seek funding/ loans from for replicating and scaling our results. To get their attention we have to show that we are backed up by a larger platform like Bridge, with many concepts. We need to show that there

are many projects developing technology within smart and flexible grids and that there will be much investment in this area in the future.

By creating a dialogue between Bridge and EIB/DG Regio, we need to educate EIB/DG Regio in the necessity of smart grids and for EIB/DG Regio to educate Bridge and FlexiGrid in what they expect from us, to be able to make investments and which instruments they have for investments. For this to happen, we should initiate a group within Bridge that will work with funding. An early step is to establish this group and also lift the question within Bridge about what our relations to EIB and DG Regio already looks like today.

FlexiGrid provides solutions for the energy transition, which we expect EIB/DG Regio to put on top of their agenda. Therefore we expect to find many opportunities within their different funds.

Regulatory bodies

EU's Clean Energy for All Europeans Package puts new demands on the European electricity market. One part of the package deals with the market design and seeks to establish a modern design for the EU electricity market, adapted to the new realities of the market – more flexible, more market-oriented and better placed to integrate a greater share of renewables.

The electricity market design elements consist of four dossiers - a new electricity regulation and amending electricity directive, risk preparedness and a regulation outlining a stronger role for the ACER (see European commission, Clean Energy for all Europeans package).

FlexiGrid provides the means to lobbying towards the removal of policy and regulatory barriers at local, national, European (and even global) scale for large-scale uptake. The relevant governments and institutions need to get comprehensive information about the benefits of the new solutions provided, the potential for replication and exactly what needs to be done in order to gain all the benefits.

NEED: The EU Commission wants to remove policy and regulatory barriers for large-scale uptake. “Regulatory bodies” gathers those who are impacted by or influencing FlexiGrid, and those who provide skills, knowledge, decision making, and/or approval to the project. This target-group is constituted by the European Commission and the direct beneficiaries of the project and the in-kind providers. The special communication effort for this audience, such as ISGAN, is mainly due to its importance as catalyst for external communication to reach the primary audience. The expected level of commitment is “operational”.

BRIDGE

Bridge is a European Commission initiative which unites Horizon 2020 Smart Grid and Energy Storage Projects to create a structured view of cross-cutting issues which are encountered in the demonstration projects and may constitute an obstacle to innovation.

The Bridge process fosters continuous knowledge sharing amongst projects thus allowing them to deliver conclusions and recommendations about the future exploitation of the project results, with a single voice, through four different Working Groups representing the main areas of interest: Data management, Business models, Regulation, Customer engagement (h2020-bridge.eu).

FlexiGrid is a member of Bridge and may participate and collaborate in the Bridge-network. We are therefore invited to participate in their events, meetings and webinars. Most of their activities are set in Brussels and it is important for the project to be present at these activities. By connecting to other similar projects we build strength and may have an impact on the EU-commission using Bridge as a channel.

ISGAN

ISGAN is an international smart grid organ with states as members. It is one of the TCPs (Technology Collaboration Programmes) under the wing of the International Energy Agency (IEA) as well as an initiative of the Clean Energy Ministerial (CEM).

ISGAN has a powerful position when it comes to high-level regulatory issues and has the capability to reach many countries on a national level. FlexiGrid has good relations already established within ISGAN and possibilities are good to make an impact here. We could reach them by making the effort of producing a deliverable on one or a few high-level regulatory issues. This could be in the shape of a report, video, webinar or other forms of well-established deliverables. This is preferably done in cooperation with other projects. One suggestion is to use our sister project NESTNet.

Members of ISGAN's working groups are well understood in the technology of smart grids and should be communicated with on a level of high understanding of the technology. Through ISGAN we may reach IEA.

National regulatory bodies

Much of the power to have direct impact on the regulatory mechanisms lay at a national level. Below we describe the regulatory bodies in the countries where our demo sites are situated.

The areas of the demo sites

Bulgaria

Overview

The national electric power transmission grid in Bulgaria is owned by the state and is governed by Electricity System Operator (ESO). On a local level the distribution grids are owned by four private DSO companies, where the three larger companies cover above 99% of the country area and the connected business and private customers: Energo-Pro to the north-east (FlexiGrid partner), CEZ to the west and EVN to the south-east. Energy and Water Regulatory Commission is the national regulatory authority and it is responsible for implementing national policies in the energy sector.

The base plants (thermals and nuclear) produce almost 80% of the energy in Bulgaria. Nuclear power accounts for slightly over 15% of the energy produced in the country. Thermal energy on the other hand, accounts for around 60% but due to changes in regulations as well as planned decommissioning trajectory, they are continuously being replaced by RES (third largest source of electricity in Bulgaria). Hydro plants account for approximately 10% of the produced electricity while solar, wind and biomass

power plants produce a little less than 15%. As stated above, these percentages are gradually increasing meanwhile shifting the role of energy production from thermal energy to that of renewable energy sources.

Policy Makers:

Energy and Water Regulatory Commission (EWRC) <http://www.dker.bg/en/home>

EWRC is the Energy and Water Regulatory Commission and it has a big influence on regulating the activities of the energy sector. At the proposal of energy companies, it may adopt new Electricity Market Rules and Network Technical Rules providing meanwhile security and reliability rules. EWRC is also issuing and controlling the licensee of key energy players: DSOs, generation >5 MWs, exchange, etc.

Analysis of keypersons within EWRC

All are based in the capital of Bulgaria, Sofia. Their age is approx. between 45-65 and there is a balanced ratio of male / female. They are in general conservative and protective. Most of them have been in the energy sector for more than 30 years thus are naturally inclined to like and support what they have developed and constructed – the coal plants, nuclear plant and the old grid system. They are not resistive to renewables but mainly focused on the challenges of having more RES and don't see it as a goal to have more. Their conservatism is very understandable and the result of the legislation design. It is their main objective to have a stable, reliable and n-1 grid/system and of course keeping the prices of electricity low today.

- <http://www.dker.bg/news/8/67/evgeniya-haritonova/d,chlenove.html>
- <http://www.dker.bg/news/6/67/svetla-todorova/d,chlenove.html>
- <http://www.dker.bg/news/14/67/ivan-ivanov/d,chlenove.html>

Ministry of Energy <https://www.me.government.bg/en>

The Ministry of Energy is a public body with the authority to develop, organize, coordinate and control the implementation of state policies in the energy sector by developing strategies, preparing and proposing legislation.

Analysis of keypersons within the Ministry of energy

Based in Sofia, Bulgaria, they are between 35-60 years of age, and with a balanced ratio of male/female. They are conservative and with high barriers (hard to reach, difficult to make changes, slow decision making). They take EU directives regarding RES into account and strive to achieve them. This is a recently made ministry, operating in Bulgaria since 2014. Important decisions such as introducing new laws and policies need to go through the Parliament first.

- <https://www.me.government.bg/en/teams-minister-1/temenuzhka-petkova-29.html>
- <https://www.me.government.bg/bg/teams-cabinet-1/jecho-stankov-30.html>
- <https://www.me.government.bg/en/departments/energiini-strategii-i-politiki-za-ustoichivo-energiino-razvitie-6-1.html>

Sustainable Energy Development Agency (SEDA) <https://www.seea.government.bg/en/about-seda-en>

Sustainable Energy Development Agency (SEDA) serves as an administration to the Minister of Energy for the implementation of the state policy on energy efficiency improvements.

The Parliament <https://www.parliament.bg/en>

The National Assembly of the Republic of Bulgaria or shortly called the Parliament, holds the state authority to propose new laws and policies as well as holds the power to decide whether to accept and implement them.

Analysis of keypersons within the Parliament

The parliament is located in Sofia, Bulgaria. The male/female ratio is around 70/30. Age groups range from 21 to 82. The National Assembly is the only place where new laws can be suggested, introduced, changed, voted and decided whether to be implemented. Upholding EU directives regarding RES, has made them part of their agenda. Only members of the parliament and ministers may propose new laws and unfortunately, the system is not very fast so it could be months before a decision is made. (We would likely not communicate with the National Assembly directly, but as an important decision maker there was a need to include them in this analysis)

DSOs & TSO

ERP Sever <https://www.erpsever.bg/> (Linked Third Party to EPRES)

ERP Sever is the holder of a license for the distribution of electric power. The company transmits electricity through the electricity distribution grid for the purpose of supply to the end customers on the regulated and free market. ERP Sever is one of the three main electro-distribution companies on the local energy market part of ENERGO-PRO group in Bulgaria.

CEZ <http://www.cez.bg/en/home.html>

CEZ is a Czech company that operates in Bulgaria and is one of the three biggest electro-distribution companies on the Bulgarian energy market. It has six companies that operate in Bulgaria and its range of activities includes trading, distribution, investment, management and other services that could contribute to developing the energy sector. In addition, CEZ is the first company to create an energy ombudsman with the purpose of guaranteeing the rights of their clients in their relations with any of the CEZ companies. CEZ has a little less than 4000 employees. As the organization also has other fields of expertise, the number of employees written are not only part of the DSO staff but of their respective companies as a whole.

EVN <https://evn.bg/>

EVN is an Austrian company that operates on the Bulgarian market and is also one of the three biggest distribution companies in Bulgaria. Its field of expertise includes trading and distribution of energy. EVN has more than 8500 employees. As the organization also has other fields of expertise, the number of employees written are not only part of the DSO staff but of their respective companies as a whole.

ERP Zlatni Pyasatsi <http://erp-zlatni.bg/>

ERP Zlatni Pyasatsi is the first privately owned electricity distribution company in Bulgaria. It's main activity includes distribution of electricity and sale of electricity to consumers.

Contact: erp@erp-zlatni.bg

ESO <http://www.eso.bg/?en>

ESO or the Electricity System Operator is responsible for the operational regime planning and control of the electrical system on the territory of Bulgaria; It synchronizes the Bulgarian power system operation in parallel with the electrical power systems of the European countries member of the UCTE and coordinates the joint operation with other electrical power systems; ESO operates, overhauls and maintains the transmission network while also organizing the balancing of the energy market.

Analysis of keypersons within DSOs

Have offices all over Bulgaria. Strive for balanced male/female ratio. Main age groups 25 - 65. Conservative, because of legislation and their business models up until now. Their objective has been and will always be 100% grid stability. Since EU and National directives promote and strive for increase in percentages used renewables, DSOs are open for innovations that can contribute to dealing with the issue of transferring from traditional fuels to RES.

IPPs (independent power producers)

AES <http://aes.bg/about-us/?lang=en>

AES is an independent power producer, amongst the largest global power companies in the field of conventional and alternative energy sources as well as the biggest investor in Bulgaria over the last 20 years. In 2009, AES built a 156 MW Wind Farm, called Saint Nikola (largest wind farm in Bulgaria).

<https://www.linkedin.com/in/ivan-tzankov-fcca-6a49ab14/>

Individual Producers

Individual Producers of small RES built for personal use to cover their own needs and sell the surplus or built/bought for trading on a small scale on the energy market.

Identifying such through networking and research

Investors

Investors that would like to build and own RES so they can trade energy.

Analysis of keypersons within IPPs

They are innovative and modern. Their business models are based on developing RES. They are not only open but supportive and encouraging of the creation of new technologies and methods for grid development.

Identifying keypersons through networking and research

State-Owned Producers and Suppliers:

NEK <https://nek.bg/index.php/en/>

Natsionalna Elektricheska Kompania EAD (NEK EAD) is a single-owner joint-stock company that is part of Bulgarian Energy Holding EAD (BEH EAD). BEH EAD is a 100 % state owned joint-stock company. It includes many other similar companies that although brought together in the holding structure, retain their operational independence and licences.

Contact: nek@nek.bg

Kozloduy NPP <http://www.kznpp.org/index.php?lang=en>

Kozloduy NPP plc is the only nuclear power plant in Bulgaria and base electricity generating plant providing more than one third of the total annual electricity output of the country. This determines the significant position the company holds - being a factor of economic sustainability both nationally and regionally. Kozloduy NPP generates the cheapest electricity in the country, thus ensuring and maintaining affordable price of electricity for Bulgarian end-consumers.

TPP Maritsa East 2 <https://www.tpp2.com/>

TPP Maritsa East 2 is the largest thermal power plant in Bulgaria. It is one of the three thermal power plants in "Maritsa East" Complex, which is located in the South-East part of the country.

Energy Exchange

Independent Bulgarian Energy Exchange <http://www.ibex.bg/en>

IBEX (Independent Bulgarian Energy Exchange) holds a 10-year license by the State Energy and Water Regulatory Commission for organizing a Power Exchange for electricity in Bulgaria. The efforts of IBEX EAD are aimed entirely at providing a reliable, transparent and competitive electricity trading platforms to enable market participants to enter into transactions through a variety of products.

NGOs:

NGOs are non-profit organizations that gather like-minded people as well as companies with similar goals. In the case of the FlexiGrid project, the NGOs chosen are ones that have interests in innovating the energy market and especially in the case of renewable energy. They are very open to change and they themselves might have information about possible obstacles as well as can be used for feedback and consulting.

Energy Management Institute <https://www.emi-bg.com/en/news/1>

Energy Management Institute is an NGO that strives to contribute to the sustainable development of the Bulgarian energy sector and its integration to the European Union as well as aims to improve international cooperation in order to utilize international experience and implement in Bulgaria worldwide established best practices. Since March 2014 EMI has been a fully-fledged Bulgarian member of the biggest association on electricity industry in Europe - EURELECTRIC.

https://www.linkedin.com/company/energy-management-institute-emi-?trk=pro_other_cmpy

The National Energy Chamber <http://necbg.eu/en/home/>

The National Energy Chamber was established as a key partner to policy makers in the energy sector of Bulgaria. The Chamber represents more than 50% of the privately-owned installed capacity and almost 70% of the employed in the private energy sector.

Contact: Vera Asenova, +359 893 062124, nec_office@necbg.eu

Hydroenergy Association <https://hidro-energia.org/en/about-us/>

Hydroenergy Association is a NGO representing the interests of the strategic investors in energy production from hydropower plants in Bulgaria. Its objectives are aimed at developing policies and strategies for improving market conditions and growing the hydropower sector.

<https://www.linkedin.com/in/hydroenergy-association-725987133>

Bulgarian photovoltaic association <https://www.bpva.org/en/index>

Bulgarian Photovoltaic Association is a NGO unifying more than 400 companies from the renewable energy sector in Bulgaria. Its mission is sustainable, low-carbon, modern and corresponding to the European standards energy sector. The Association maintains effective communication with National institutions, the non-governmental sector and international organizations.

Keyperson: <https://www.linkedin.com/in/bulgarian-photovoltaic-association-ab171158>

Association of traders with electricity in Bulgaria <https://ateb.bg/en/>

Association of traders with electricity in Bulgaria is a non-profit organization bringing together leading energy trading companies in Bulgaria. The main mission of ATEB is to promote and facilitate the development of competitive electricity market in Bulgaria, to create and establish modern economic relationships in the energy field as well as to refine the market infrastructure and to improve the principles and the mechanisms of the legal framework in the country, which regulates the business relations in the energy field.

Contact: info@ateb.bg

Association for Free Energy Market <https://asep.bg>

The Association for Free Energy Market was founded as a union of traders of electricity and is also open to electricity consumers and producers as well, as they believe that the establishment of a stable, transparent and predictable market is possible only with the combined and coordinated effort of all of its participants. In connection to the latter, ASEP provides a platform for constructive dialogue and exchange

of ideas between its members and provides representation between public authorities and other national and international organizations in the field.

The Bulgarian Industrial Association (BIA) <https://en.bia-bg.com>

The Bulgarian Industrial Association (BIA) is a non-profit organization whose members can be Bulgarian and foreign legal and physical persons of legal capacity, conducting business activities. It represents and protects the interests of its members before the state, public and international bodies and organizations as well as cooperates for the development of sustainable market economy and qualitative growth.

Bulgarian Industrial Capital Association (BICA) <http://bica-bg.org/>

Bulgarian Industrial Capital Association (BICA) is the most extensively represented organization of Bulgarian employers. It is also the most dynamically developing organization of Bulgarian businesses, which is represented at national level. It protects the interests of its members in front of the executive and legislative authorities at national and European level, influences the preparation of the normative base and the policies in the economic sector, makes systematic efforts for improving the competitiveness of Bulgarian enterprises and for creating favourable business environment and for enhancing the Bulgarian economy in general.

The Bulgarian Chamber of Commerce and Industry <https://www.bcci.bg>

The Bulgarian Chamber of Commerce and Industry (established in 1895) is an independent, non-governmental organization for assistance, promotion, representation and protection of the business interests of its members, which contributes to the development of international economic cooperation and provides assistance for the European and international integration of the Republic of Bulgaria.

Electric Vehicle Industrial Cluster <http://www.emic-bg.org>

Electric Vehicle Industrial Cluster is a national sector organization for electric mobility. It brings together its members for industrial, technological and business development, strategic developments, legislative changes, higher and vocational education and training, standardization connection with central and local authorities, etc. **Association of Bulgarian Energy Agencies** <http://new.abea-bg.org/?lng=EN>

The Association of Bulgarian Energy Agencies is an NGO founded by agencies for energy management on local and regional level, constituted with the financial and methodological assistance of the European Commission. Their mission is to coordinate and to join the potential and the experience of its members and to present them and their positions to the Bulgarian governmental, regional and local authorities, the private communities and to the bodies of the EC and the reflex group (DG ENER) of the Directorate on Energy for Europe as well as to the energy efficiency network ManagEnergy and other international organizations and structures.

Key person: Iliyana Adjarova, +359 32/ 62 57 54, liyana.adjarova@eap-save.eu

Academia

The energy sector in the academic field used to be mainly represented by men but in recent years male/female ratio has begun to balance itself. The age groups are divided between the staff that teaches/leads researches (30 - 60) and the students (18 - 30) in front of which they present their expertise or findings. Both groups find innovations interesting and are open to change.

Sofia University <https://www.uni-sofia.bg/index.php/eng>

Sofia University is the oldest as well as the biggest university in Bulgaria. As claimed by the university itself, it is the most prestigious scientific hub in the country.

Key person: Atanas Georgiev (<https://www.linkedin.com/in/atanasgeorgiev/>)

Bulgarian Academy of Sciences <http://www.bas.bg/en/>

The Bulgarian Academy of Sciences is the leading scientific, spiritual and expert center of Bulgaria. The Academy has a consistent policy for the development of science and innovation as a condition for economic progress in the country. Scientific and applied research in nine divisions covering all areas of human knowledge are conducted in the Academy.

Technical University Varna <http://fs.tu-varna.bg/>

Technical University Varna's mission is to be a factor in the development of the intellectual potential of Bulgaria, to support the process of sustainable development and to contribute to the achievement of new standards in communication of people.

Technical University Sofia <https://tu-sofia.bg/>

Technical University Sofia is the first and largest university, having fostered the emergence of most of the higher technical colleges in the country with the highest accreditation grade of all higher schools in Bulgaria, setting educational standards and introducing national priorities for development of education and science.

University of Ruse <https://www.uni-ruse.bg/en>

University of Ruse's calling is the dissemination of knowledge, carrying out fundamental and applied scientific research as well as the introduction of innovation into practice, thereby contributing to the development of highly qualified specialists and to the sustainable development of the region and the country. It strives to become an indelible part of the European education and research space.

Sofia Tech Park Labs <https://sofiatech.bg/laboratory-complex/>

Sofia Tech Park is the first science and technology park in Bulgaria, created with the aim to be established as a platform for exchange of knowledge and ideas between the academic field, the business, the government and society. The Laboratory complex, part of the park, was created with the purpose of conducting research, development and innovations.

labs@sofiatech.bg <https://sofiatech.bg/stp/contacts-main/>

Energy media

About: Open to new information and technologies, but their interest lays in material gain rather than love for innovations. For good quality articles and interviews, you would need to pay. For that reason they are not of big interest.

Capital <https://www.capital.bg/>

Capital is one of the most influential newspapers in regards to economic news and analysis of the Bulgarian market. <https://www.linkedin.com/company/economedia/>

Utility.BG <https://events.utilities.bg/utilities-archive/>

Utility.BG is the first and most widely known monthly B2B edition in Bulgaria covering topics related to energy and utility management in sectors such as infrastructure, energy production and trade, water, heating, telecommunications, asset support in industry, legal and regulatory framework.

Publics.bg <https://www.publics.bg/en/home/>

Publics.bg is an online media with the mission to develop knowledge in the field of energy, public services and utilities.

Via Expo <https://viaexpo.com/en/>

Via Expo is a company that helps introduce new products and services to a specialized business audience. Thus helping companies grow their business while finding new markets and customers.

Energy Review <https://www.energy-review.bg/>

Energy Review a leading Bulgarian magazine for energy products and technologies. It offers professional technical articles as well as up-to-date product and industry information.

3E News <http://3e-news.net/en>

3eNews is an independent online platform for daily publication in the areas of economics, energy, ecology and new technologies.

Key person: Galina Alexandrova (<https://www.linkedin.com/in/galina-alexandrova-4abbab25/>)

Green Tech <https://greentech.bg/>

GreenTech.bg is a Bulgarian web space where you can find the latest information from the world of green.

Contact: office@greentech.bg

Channels – where do we reach them?

Thanks to the good integration of Energo Pro Energy Services as well as the vast experience that Teodor Bobochikov (Entra Energy) have in the energy sector, our main channel of reach would be direct. By contacting directly people that both organizations have come into contact with previously, we would be able to shorten the time needed to reach important stakeholders for the project.

Are there collaborative networks that the keypersons participate in?

Different conferences and events in regard to the energy sector where new practices can be introduced, issues discussed, and experience shared. Such events could also serve as ground for promoting FlexiGrid project while also expanding our network.

Do they use social media?

The main form of media we plan of using is LinkedIn as though it we can reach key people both in Bulgaria and abroad, get their contact information or through their activity receive information about upcoming events, new technologies developed or any other type of information necessary for successful project execution.

Which newspapers do they read?

The newspaper they usually read include the energy medias that we have indicated in this analysis: Capital, 3ENews and GreenTech. Other newspapers they might be reading include Bulgarian daily newspapers “Trud” as well as “24Chasa”, but as we don’t see them as serious and as project oriented, we have decided not to include them in the target groups.

How do they normally get information they use for decision making?

Most of the target groups come from very big organizations that have many staff available. Decisions are usually based on reports, research and information provided by internally established practices and ways of gathering information.

The table below shows how the stakeholders in Bulgaria are positioned in relation to high interest for flexible and smart grids and also how high influence they in regards to our goals.

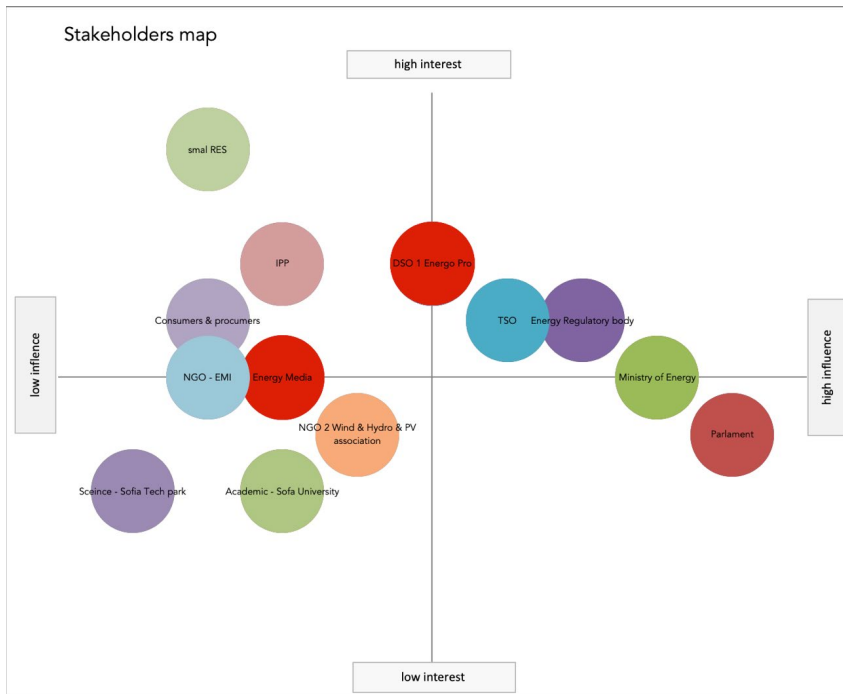


Figure 1. Stakeholders map for Bulgaria

Main source of intelligence about Bulgarian target groups is Teodor Bobochikov of the Bulgarian company as well as FlexiGrid partners from Entra Energy, Energo Pro Energy Services and Technical University of Sofia.

Turkey

Overview

Turkey's energy policy is to maintain a high-quality, reliable, continuous and cost-effective supply while maintaining a liberal, competitive, transparent, non-discriminatory and stable market. Turkey also intends to reduce its dependence on imported energy. To achieve these ends, the Turkish government has been reforming its energy laws while trying to promote private investment in the electricity market.

During the course of this liberalisation process, a new licencing regime was introduced in 2013 by the Electricity Market Law and the Electricity Market Licensing Regulation.

Turkey has big potential for renewable energy resources and government policy pays special attention generating renewable energy. Turkey is ranked fourth in the world in terms of geothermal potential. Alongside this, Turkey also places emphasis on wind and solar energy. The Ministry of Energy and Natural Resources (MENR) published its Strategic Plan for 2015 to 2019 which sets out an increase in renewable energy. The aim is to produce 30% of Turkey's electricity generation from renewable sources by increasing the installed capacity of:

- Hydroelectric power to 32,000 MW.
- Wind energy to 10,000 MW.

- Solar energy to 3,000 MW.
- Geothermal energy to 700 MW.

Recent trends

The most important recent development in the electricity market has been the introduction and integration of renewable energy zones into legislation through the Regulation on Renewable Energy Zones in 2016. These zones are exclusively allocated to establish generation facilities based on renewable energy resources.

Main regulatory authorities

The Ministry of Energy and Natural Resources

This broadly determines Turkish energy policy.

The role of The Ministry of Energy is given below:

- Adopting policies to ensure effective coordination of domestic and foreign capital investments to be made within the country
- Increasing the legislative alignment with the EU's energy acquis
- Monitoring energy markets in high level and prepare strategies for medium and long term
- Web: <https://www.enerji.gov.tr/tr-TR/Anasayfa>

The Energy Market Regulatory Authority (*Enerji Piyasası Düzenleme Kurumu*) (EMRA). EMRA is the market regulator. It is an autonomous, public legal entity with administrative and financial authority established to regulate and monitor **electricity**, natural gas, petroleum and liquid petroleum gas markets. EMRA is governed by the Energy Markets Regulatory Board. EMRA can create and approve tariff levels, issue licences, establish quality service standards and address other matters such as management and consumer complaints arising from lack of quality or interruptions in the power supply. EMRA often co-operates with the Turkish Competition Authority, and its decisions can be appealed before the administrative courts.

The Nuclear Regulatory Authority (*Nükleer Düzenleme Kurumu*) (NRA). The NRA has replaced the Turkish Atomic Energy Authority (TAEK). Therefore, the responsibilities of the former TAEK have been taken over by the newly established NRA. The NRA regulates and supervises the facilities, equipment, materials and operations in the field of nuclear energy and ionizing radiation.

Main companies

Following the liberalisation and privatisation of the electricity market in 2001, electricity generation, distribution and supply was opened up to private entities and is now carried out by both private and state-owned companies alongside each other.

TSO

Transmission is a monopoly belonging to the Turkish Electricity Transmission Company (TEİAŞ). TEİAŞ was initially solely responsible for operating the system but when a new type of market operation licence was introduced under the Electricity Market Law in 2013, EPIAŞ, was also granted a licence. TEİAŞ continues to operate the balancing power market and the ancillary services market.

EPIAŞ is responsible for operating the day-ahead market and the intraday market. EPIAŞ is jointly owned by TEİAŞ (with A class shares representing 30% of the share capital), Borsa Istanbul (with B class shares representing 30% of the share capital) and private entities (with C class shares representing 40% of the share capital).

DSOs

Turkey is divided into 21 distribution regions. The distribution assets are all owned by the Turkish Electricity Distribution Company. The right to operate in each region is granted to private entities through transfer of operation rights. Each distribution company holds a licence issued by the Energy Market Regulatory Authority.

The distribution licence holders must operate the system within their distribution zone under the relevant laws and regulations on an impartial basis. The distribution companies are also responsible for the maintaining and expanding investments and maintaining and reading the meters of the system users.

After the privatisation process between 2009-2013, all distribution companies (each privatised through transfer of operations rights of the network for their respective regions) obtained a distribution licence from EMRA.

Although the distribution system assets are still held by the state-owned Turkish Electricity Distribution Company (TEDAŞ), the distribution activities are now carried out by the private sector.

The Electricity Market Law further prohibits distribution companies from being involved in any activity other than distribution.

Sources of electricity generation

According to figures published by the Energy Market Regulatory Authority (EMRA) in its January 2019 electricity sector report, the following are the main sources of electricity generation:

- Natural gas: 25,647 MW (30.76%).
- Hydro (dam): 20,566 MW (24.66%).
- Lignite: 9,797 MW (11.75%).
- Imported coal: 8,939 MW (10.72%).
- Hydro (river type): 7,782 MW (9.33%).
- Wind: 6,947 MW (8.33%).
- Geothermal: 1,303 MW (1.56%).
- Other sources: 2,406 MW (2.89%).

Fossil fuel

According to the figures published by EMRA, fossil fuels constitute almost 53% of electricity generation in Turkey.

Renewable energy

The renewable energy sector has been growing since 2005, when Turkey passed the Renewable Energy Law. The Renewable Energy Law defines renewable energy resources as:

- Those using wind, solar, geothermal, wave, tidal, drift, biomass or biogas resources.
- River or canal hydroelectric generation facilities.
- Hydroelectric generation facilities with a reservoir area smaller than 15 square kilometres.

Currently, wind, hydro and solar are the main renewable sources used in Turkey. According to EMRA's 2018 annual sector report, the share of renewable sources in the total installed capacity is 44.70% (including hydroelectric sources).

RES policies/incentives

One of the main incentives provided to generation facilities based on renewable energy sources under the relevant legislation is that the Turkish Electricity Transmission Company and/or holders of distribution licences will give priority to the facilities generating electricity from renewable energy resources when connecting them to the transmission and/or distribution systems.

Renewable energy targets

There are currently no legally binding renewable energy targets. However, according to the Strategic Plan for 2015 to 2019 released by the MENR, it is intended to increase the share of renewables to 30% of total electricity generation by increasing the installed capacity of hydroelectric power to 32,000 MW, wind energy to 10,000 MW, solar energy to 3,000 MW and geothermal energy to 700 MW.

The electricity market has undergone major restructuring and is still in the process of becoming stable and competitive. With the aim of improving the legal environment, there have been frequent changes to both primary and secondary legislation, which decreased the predictability of the market to a certain extent.

In addition, the applicants and/or preliminary licence holders must deal with separate administrative authorities. The development of a project requires many permits to be secured from different bodies which can cause delays to project development due to lack of co-ordination.

Consumer

Eligible consumers (who have an annual electricity consumption of at least 600 kWh for 2019) can freely choose their own suppliers and determine sale prices. Consumers that fall below the annual limits set by the Energy Market Regulatory Authority (EMRA) must purchase electricity from the incumbent supply companies based on the tariffs set by EMRA.

The incumbent supply companies can trade electricity with other suppliers without being subject to any tariffs.

Media and social media

The media of Turkey includes a wide variety of domestic and foreign periodicals expressing disparate views.

However, media ownership is concentrated in the hands of a few large private media groups which are typically part of wider conglomerates controlled by wealthy individuals, which limits the views that are presented. In addition, the companies are willing to use their influence to support ‘their owners’ wider business interests, including by trying to maintain friendly relations with the government. The media exert a strong influence on public opinion.

National mainstream newspapers are Sabah, Hurriyet, Milliyet and Haberturk(on the internet).

In the regions it’s changing depending on political, sociological and cultural structure. For example in Eskişehir is a city where university students live mostly. For young people, reading the newspapers on the net is preferable.

For state stake holders in the region, we’re choosing face to face communication usually. We’re requesting appointment.

All stakeholders using social media. NGO’s mainly use twitter and Instagram.

All Universities have facebook and instagram accounts besides twitter.

Main channels to reach the Turkish target groups is first and mainly from social media. Government channels are also very effective on their decisions recently.

Main sources of intelligence about Turkish target groups are thomsonreuters.com and the FlexiGrid partner companies T4e and OEDAS.

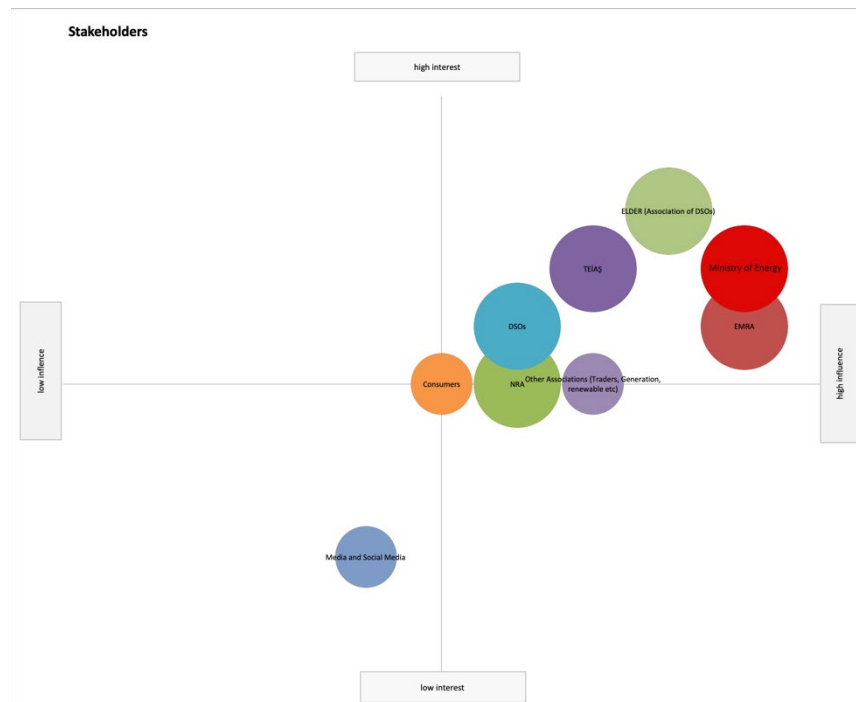


Figure 2. Stakeholders map for Turkey

Sweden

The larger part of the electricity in Sweden comes from hydro plants in the north of the country, and nuclear power, both providing Sweden with approximately 40% of the electricity each. Wind power is the third largest source of electricity with approximately 10% of the produced electricity, then follows co-generation and biofuel-based generation. Solar energy is still limited.

The national high-voltage grid is run by the governmentally owned TSO (Transmission System Operator), Svenska kraftnät.

At the local level the power grids are owned by DSOs (Distribution System Operators) all over the country, 190 DSOs in total. In most cases they are owned by local authorities and cities, but the three major DSOs are:

- Vattenfall (gov)
- Ellevio (private)
- Eon (private)

With reference to EU law, DSOs are natural monopolies, i.e. they have geographical concessions protecting their grids. DSOs should act as “neutral actors” and be separated (stay unbundled) from the market actors, e.g. electrical traders and service providers.

National target groups

The national trade organisation for DSOs and electricity suppliers is called **Energiföretagen**. It is financed by its members; the DSOs and traders and should be the business’ extended voice in the debate. It also runs common research projects, that are considered important for the business. The organisation works with PR to represent the interests of its members. Energiföretagen could be important for FlexiGrid to reach and establish good relations. If the project gets Energiföretagen’s attention, it could be helpful to both reach the DSOs in the country and also regulatory bodies in Sweden.

The national association **Power Circle**, mainly pushing for increasing the market for electrical vehicles, is also available for electrical power companies in general, including DSOs, electricity suppliers and also battery manufacturers and other companies in the electricity business. FlexiGrid has a possibility to reach DSOs and highlight its outcomes in Power Circles’ seminars and events.

Electricity network operations in Sweden are regulated by the **Swedish Energy Markets Inspectorate (Ei, Enerigmärknadsinspektionen)**. This is a governmentally owned regulator, which controls the electricity market. Ei sets the income frame for DSOs, which based on i.a. DSOs’ assets and No. of customers. To establish a good relationship with Ei could be important for influencing the regulatory bodies of Sweden.

Swedish smartgrid / Forum för smarta elnät

This is a platform for the development of smart electric grids, deployed by the Swedish government. It facilitates dialogue and connects stakeholders for the development of smart grids.

It is in the interest of FlexiGrid to develop a good relationship with Swedish smart grid, since it is closely connected to the Swedish government. It also works closely with the Swedish Energy Agency. FlexiGrid

should establish a good relationship with the forum in order to influence it, while getting important intelligence in return. This is in both FlexiGrid's and Swedish smart grids' interest.

A national issue is the increasing lack of electrical grid capacity, which causes problems, especially in and around the larger cities. Establishing various flexibility mechanisms could be a way to tackle the problem. Here, DSOs could play an important role in the future. Many grids are old and need to be updated.

The industry is increasingly aware of the problem. Some industries already offer flexibility services when their business allows to do so, however there could be a potential for flexibility services in this sector.

Local/internal target groups

FlexiGrid has two partner DSOs in Sweden. One is Akademiska hus, owning university buildings and is first and foremost a real estate owner that also runs its own power grids.

The other DSO is Göteborg Energi Nät AB, GENAB, a DSO owned by the municipality owned electricity utility Göteborg Energi, GE. GENAB and GE are separate companies, according to the unbundling regulation, however located in the same buildings.

GENAB and GE are interested in influencing policy and regulation development. They are members of the national trade organisation Energiföretagen, where they historically have had important roles. FlexiGrid already has a good relation to this organisation, since they are part of the project. One possibility for FlexiGrid is to use GE as an influencer to reach other DSOs.

Regional target group

The regions of Sweden are municipalities that are geographically close coming together in a larger autonomous governing unit. The regions normally control the health care system, the public transportation, regional development, etc. The region in which GE is working is the biggest employer in Sweden.



Figure 3. Stakeholders map for Sweden

Main source of intelligence about Swedish target groups is Henrik Forsgren of the Swedish FlexiGrid partner company Göteborg Energi and target group web pages.

Switzerland

Background

Switzerland has the lowest carbon intensity among IEA countries, owing to a carbon free electricity sector dominated by nuclear and hydro generation. However, following the 2017 decision of the Swiss people to gradually phase out nuclear power, Switzerland’s energy sector is undergoing a considerable transition.

Filling the gap left by nuclear power closures while maintaining low carbon generation and high standards of supply security will be one of the challenges that Switzerland has to address in its long-term energy strategy. The country’s Energy Strategy 2050 maps the way towards a low-carbon economy in which higher energy efficiency and renewable energy sources replace nuclear energy.

In this context, the latest IEA review of Switzerland's energy policies focuses on two areas that are critical to guiding it towards a more secure and sustainable energy future: the design of the electricity market and the climate policy for the post-2020 period. The new energy strategy will require opening the Swiss electricity market and full integration into the European electricity market to meet future energy needs.

Overview

There are about 800 entities involved in the production, distribution and supply of electricity in Switzerland. These companies not only supply electricity to around 8 million people, but also provide energy to customers in industry and trade. Companies of diverse sizes are involved, ranging from small entities supplying individual municipalities to international conglomerates.

In Europe, Switzerland plays a key role as an electricity hub. One important pre-requisite for safeguarding future electricity supply is to integrate the Swiss electricity market into the European market. Europe and Switzerland are opening up their electricity markets. One of the key requirements of this is for all end consumers to have access to the grid on equal terms. Moreover, Switzerland and the EU have entered into negotiations on a bilateral electricity agreement, which aims to ensure reciprocal market access in the electricity sector.

Switzerland decided to liberalise its electricity markets in two steps:

- In 2009, end users with an annual consumption of more than 100,000 kilowatt hours (kWh) were given access to the electricity market.
- In the future (probably in 2020), households and other small-scale consumers will be able to freely choose their electricity provider.

The electricity market is an important economic sector in Switzerland and a large number of jobs depend on it.

Regulatory framework

The main legislation for electricity is the Electricity Supply Act (*Stromversorgungsgesetz*) together with the Electricity Supply Ordinance (*Stromversorgungsverordnung*). These two pieces of legislation partly introduce liberalisation of the electricity market in Switzerland.

The Energy Act (*Energiegesetz*) sets out the requirements and provisions on the economical and rational use of energy and the promotion of renewable energies. The Electricity Act (*Elektrizitätsgesetz*) is mainly relevant to grid construction. In the area of nuclear energy, the Nuclear Energy Act (*Kernenergiegesetz*) applies.

Main regulatory authorities

- Swiss Federal Office of Energy (BFE).
- Federal Electricity Commission (ElCom).
- Federal Inspectorate for Heavy Current Installations (ESTI).
- Swiss Federal Nuclear Safety Inspectorate.
- Competition Commission.

- Federal Office for the Environment.

TSOs

The Swiss power grid is divided into seven network levels, operating at different kilovolts. Swissgrid is the national grid company.

DSOs

Switzerland's electricity supply to end users is provided by around 700 companies. Many of the electricity companies provide electricity to one or more municipalities and are also responsible for supplying water and gas. In some cantons and municipalities, a single vertically integrated company is responsible for these supply tasks, while in other cantons a variety of companies share responsibility.

Oiken, the FlexiGrid partner DSO in the Sion region, is equipped with high-capacity electric grids, since they are a large energy producer from hydroplants and provider for a bigger area than only their own region. The president of the DSO is also the president of the city, a politician. Key persons to reach within the DSO is the president, the CEO, the Head of Marketing and Head of Development.

The DSO doesn't estimate to have capacity problems within at least 10 years. Capacity issues might not be the strongest motivation for them to implement FlexiGrid technology. What might motivate them is the possibility to make accurate forecasts of input and output of the grid and also more accurate ways to follow their forecasts. Today the DSOs have huge costs because of fines they have to pay for the discrepancy between forecast and reality.

Electricity generation and renewable energy

Electricity in Switzerland is generated from the following sources:

- Hydropower: around 57%.
- Nuclear: around 37%.
- Renewable energy (other than hydropower, including solar, thermal power and wind): 6%.

Fossil fuel

Switzerland has no fossil energy resources. Therefore, Switzerland imports all fossil fuels and gas products.

Nuclear fission

In 2011, the Swiss government decided to gradually withdraw from the use of nuclear energy as a reaction to the nuclear reactor incident in Fukushima, and to strengthen renewable energy sources. The existing five nuclear power plants will be decommissioned when they reach the end of their safe service life and will most likely not be replaced.

Renewable energy

Renewable energy provides more than 60% of the electricity produced in Switzerland. Due to the topography and high levels of annual rainfall, the conditions for using hydropower are ideal in Switzerland. Hydropower is Switzerland's longest serving and most important domestic source of renewable energy. Other renewable sources include:

- Biomass energy (wood and biogas).
- Solar power.
- Wind power.
- The energy of waste and sewage.

These other renewable energy sources are playing an increasing role in electricity production. However, at present they only account for around 6% of overall electricity production in Switzerland.

Feed-in tariff, a government policy.

The main instrument promoting electricity production from renewable energy sources is a feed-in tariff. A feed-in tariff is available for hydropower with an output up to ten megawatts (MW), photovoltaic, wind energy, geothermal energy, biomass and biological waste. The tariffs are specified on the basis of reference power plants for each technology and output category. Remuneration applies for 20 to 25 years, depending on the technology, and is only available for new production facilities that are put into operation and are registered with Swissgrid. At present there is a waiting list for registration of new production facilities. In addition, the remuneration rates are subject to a gradual downward curve in view of the anticipated technological progress and the increasing degree of market maturity of new technologies.

Renewable energy targets

The Energy Act sets out a goal to increase the annual average electricity production from renewable energy sources by at least 5,400 gigawatt hours (GWh) up to 2030, compared to the production level in 2000. To this end, the electricity generated from renewable energy sources outside the country can be taken into account by the Federal Council up to a maximum proportion of 10% of the contribution of the aimed for electricity production enhancement by (domestic) renewable energy sources. The annual average electricity production from existing hydropower plants will be increased by 2,000 GWh up to 2030 compared with the electricity production level recorded in 2000. These targets are meant to be binding, but no direct sanctions are in place if these objectives are not achieved.

The main obstacle to the development of renewable energy is the lack of acceptance of the necessary construction measures. There are concerns over the protection of nature and landscape as well as technical and financial obstacles. The energy density of the energy sources is mostly low. In addition, production is irregular, particularly for solar and wind power. Lastly, high upfront costs of renewable projects have also been an obstacle to building significant projects.

Transmission charges

The costs of the power grid are mainly paid by the end user. Under the principle of cost roll-up, the chargeable costs are recycled from the higher to the lower network levels. Therefore, even the costs for the transmission grid together with the costs of the distribution network are taken into account in the grid usage tariff that consumers pay.

The grid tariff must not exceed the chargeable costs plus the fees and services to the government. Chargeable costs are defined as "operating and capital costs of a secure, efficient and effective network". The capital costs include an appropriate operating profit (regulated weighted average cost of capital) (WACC). This regulation is called "cost plus" due to the fact that the term "cost" means the cost recovery, and "plus" means the operating profit.

System balancing

Swissgrid is responsible for balancing electricity production and consumption. In doing so, it ensures a stable electricity grid, which is imperative for a secure electricity supply. To achieve this, Swissgrid can purchase balancing energy on a non-discriminatory basis if needed. Unlike in some EU member states, there is currently no separate capacity market or capacity mechanism in Switzerland.

Authorisation and operating requirements

All high voltage systems and some specific low voltage systems with a voltage of more than 50 volts must undergo the planning approval procedure.

Network operators must provide information to the Federal Electricity Commission each year in relation to:

- The operation and load of the networks.
- Any extraordinary circumstances.

The network operator must also establish multi-year plans for safeguarding a secure and efficient network. Small operators can be exempted from these duties.

Consumer

Households and small businesses (below 100MWh per year). End consumers with an annual consumption of less than 100MWh per year are not allowed to choose their service provider. Under the Electricity Supply Act, these end consumers are entitled to reasonable tariffs. "Reasonable" means that the energy tariff must be based on power generation costs of efficient production as well as on the costs of long-lasting purchase contracts with the distribution system operators. The Federal Electricity Commission is the competent authority for reviewing "reasonable" tariffs.

Large consumers (above 100MWh per year). End consumers with an annual consumption of more than 100MWh can choose their electricity provider freely. Consequently, they can choose not to be supplied by their local network operator.

Source of intelligence about Swiss target groups is thomsonreuters.com and professor Jessen Page of the Swiss University and partner of FlexiGrid HES-SO.

Appendix I- SIVECO target group analysis

SIVECO is a central partner in FlexiGrid. The company develops the software and interface that is the link between the users/DSOs and the technology that is created within the project. Therefore, we estimate that a target analysis that specifies their audience and the ones they need to reach for their contribution in the project to gain impact is necessary.

Target analysis – SIVECO

The stakeholders motivated to start using the FlexiGrid Cross-functional platform are those interested by the major features / characteristics of the solution such as:

- Storage and Energy network management (including the renewable resources)
- Monitoring and control (observability and controllability) of distribution grid
- Modelling (smart algorithms for DR, predictive algorithms, simulations ...)
- Optimization considering peak values of consumption and costs
- Forecasting
- Analytics
- Financial and investments.

The following stakeholders could be considered as parts of FLEXIGRID ecosystem:

- DSOs, TSOs (energy operators)
- Energy service providers (Suppliers / Retailers)
- Public Utility companies
- Governance (ministries, agencies)
- Municipality representative
- National Regulatory Authority
- Technology providers
- Investment banks
- Real Estate developers / operators
- Local industries
- Consumers / Prosumers.

In the following we'll present some preliminary information and insights concerning some needs / demands to fulfil and specific gains of the above-mentioned stakeholders when using FLEXIGRID Cross-functional platform. Details will be provided based on a target group extended analysis.

DSOs, TSOs (energy operators)

Needs:

- Performing the energy network management (based on smart capabilities) by minimizing financial and technical implementation risks
- Compliance with regulatory requirements

Expectations / Gains:

- Optimizing the energy consumption
- Improved forecast of energy consumptions and energy losses
- Quality of energy supply
- Usage of innovative technologies for the benefit of customers and the environment
- Research and implementation of renewables (particularly wind and solar renewables)
- Defining new business models and preparing for market new packs of energy services

Energy service providers (Suppliers / Retailers)

Needs:

- Optimizing energy acquisition for the whole market
- Establish strategies for applying new/improved tariff policies
- Including new services in the portfolio
- Increasing revenues
- Compliance with regulatory requirements

Expectations / Gains:

- Market share
- Acquire reputation and image on the market
- Diversification of services portfolio
- Transparency in tariff policies

Public Utility companies (gas, water, sewage services)

Needs:

- Performing the public utilities management by minimizing financial and technical implementation risks
- Compliance with regulatory requirements

Expectations / Gains:

- Optimizing the resources consumption
- Better forecast of resources consumption
- Quality of utilities supply
- Defining new business models and preparing for market new packs of utility services

National Regulatory Authority

Needs:

- Allocation of budgets
- Control of expenditures

Expectations / Gains:

- Monitor and optimize the budgets allocation

Governance (ministries, agencies)

Needs:

- Set strategy and policies in the energy domain

Expectations / Gains:

- Establish calendar of requirements, strategies, policies and budgets limitations

Municipality representative

Needs:

- Deployment of new profitable and sustainable projects
- Control of expenditures

Expectations / Gains:

- Monitoring and optimising the budget allocation
- Achieving important budget savings

Real Estate developers / operators

Needs:

- Develop new profitable and sustainable projects

Expectations / Gains:

- Increase the revenues
- Gain image and reputation on specific market
- Defining new business models and preparing for market new packs of services

Technology providers

Needs:

- New markets for their portfolio of solutions and services
- Develop and implement new / innovative technologies

Expectations / Gains:

- Increase the revenues
- Gain image and reputation
- ROI (Return of Investment)

Investment banks

Needs:

- Deployment of new profitable and sustainable projects in the energy field
- Deployment of bankable (scalable, economically appealing, relative low risk) solutions

Expectations / Gains:

- Monitor, control and optimize the investments and financial resources allocation
- Define and validate bankable business models over proposed flexible distribution grid drivers, tested to reduce technical and financial risks for investors enhancing deployment at EU-scale and beyond
- Define and validate financial instruments, public as private, enhancing deployment at EU-scale and beyond

Local industries

Needs:

- New markets for their portfolio of solutions and services
- Develop and implement new / innovative technologies and / or techniques

Expectations / Gains:

- Increase the revenues
- Gain image and reputation
- Defining new business models and preparing for market new products or services

Consumers / Prosumers (benefit – cost analysis for prosumers...)

Needs:

- Track and manage the energy consumption
- Make informed decisions about an efficient and optimized energy consumption

Expectations / Gains:

- Optimize the energy consumption
- Costs reduction, energy savings
- Ensure engagement and increased energy awareness of the consumer
- Increase the number of prosumers.

Source of intelligence about SIVECO target groups is SIVECO marketing department.