DECENTRALISED ENERGY SYSTEMS WORKING GROUP LAUNCH MEETINGS

Minutes of the meetings

23rd and 28th September 2021, Online (Teams and Zoom)

List of the members

First name	Last name	Organisation
Participants on 23rd September meeting		
Michael Thomas	Maurer	Ansaldo Energia
Enrico	Bianchi	Ansaldo Energia
Ed	Kennedy-George	Aurelia Turbines
Alexander	Lautenschläger	Ayed-Engineering Gmbh
Paolo	Del Turco	Baker Hughes
Sayma	Abdulnaser	City, University of London
Carlanescu	Razvan	Comoti
Peter	Kutne	DNV
Christopher Charles	Dagnall	DNV
Simon	Gianordoli	ETN
Rene	Vijgen	ETN
Christer	Björkqvist	ETN
Valentin Moens	Moens	ETN
Piero	De Bonis	European Commission (RTD)
Fabio	Ciccateri	Finno Exergy
Wujun	Wang	KTH
Rafael	Guedez	KTH
Magnus	Genrup	Lund University
Peter	Breuhaus	NORCE
Lars-Uno	Axelsson	OPRA Turbines
Francois	Emin	OPRA Turbines
Emanuele	Martelli	Politecnico di Milano
Giacomo	Bruno Azzurro Persico	Politecnico milano
Katarina	Svabcikova	Siemens Energy
David	Tomas Sanchez Martinez	Universidad de Sevilla
Francesco	Rovense	Universidad Rey Juan Carlos
Coriolano	Salvini	Università degli Studi Roma
Ambra	Giovannelli	Università degli Studi Roma
Marco	Sorrentino	University of Salerno
Elisabet	Syverud	University of South-Eastern Norway

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Launching meeting (23rd September 2021,15.30-17.00)

Simon Gianordoli (ETN) opens the online meeting and welcome participants. He states on the main scopes of the new WG and proposes the agenda as follows:

- Introduction of the meeting – *Peter Breuhaus (NORCE)*
- Perspectives from the European Union – *Piero de Bonis (European Commission)*
- Mapping process to discuss and agree on the scope, objectives, and activities - *Elisabet Syverud, USN Campus Kongsberg*
- Follow-up topics for the working group – *General discussion*

Christer Björkqvist (ETN) highlights the new ETN's vision and the application of gas turbines in the energy systems. The WG will take stock of the needs of interests of ETN's members in this regard.

Introduction – *Peter Breuhaus (NORCE)*

Peter Breuhaus (NORCE) recalls that discussions took place regarding Micro-gas Turbines (mGT) WG at ETN Project Board. There is a need for a stronger move to integrate Gas Turbines (GT) in the energy systems and technologies application, as it was the case for the OmSop project and currently in the ROBINSON project. As the GT is part of the energy system, the topic is then more focused on how it could and should be integrated to the system. This was the main motivation to launch the WG.

Christer Björkqvist (ETN) asks if there are any questions and leaves the floor to Piero de Bonis (European Commission).

Perspectives from the European Union– *Piero de Bonis (European Commission)*

Piero de Bonis (European Commission) gives updates from the European Commission through a PPT presentation. There are some EU initiatives to be highlighted:

- Clean Energy for EU Islands initiative - link with the ROBINSON project. It has to be taken into consideration.
- 'Buildings' Round table, EU Clean Hydrogen Alliance – ETN is involved in other round table, and this one should be addressed by ETN on an energy perspective
- EU strategy on energy integration system – this one is known by the actors
- Renewables Energy Communities (Art 22 Renewable Energy Directive) – recast of the Directive in 2018. This is something relevant for our work.
- SET Plan (Strategic Energy Technology Plan) – it is 14 years old, the graph describes on the actions are distributed. More info on the next slide:
    - SET Plan Energy Initiative in Buildings Implementation WG – ETN is part of this WG
    - SET Plan Energy System Implementation WG
    - SET Plan Positive Energy Districts Implementation WG
    - Horizon Europe: European Partnerships on 'Clean Energy Transition' and on 'Driving urban transitions to a sustainable future"

Piero de Bonis (European Commission) concludes with a question: ETN is more and more using the term 'gas' as a sustainable fuel, it is the case ?

Peter Breuhaus (NORCE) answers that it is the case. Syngas from wood, biogas based on biowaste, hydrogen through an energy storage medium to replace LNG (for costs issues and rising CO2 prices) as a market differentiator will be used in the ROBINSON project for example.

Piero de Bonis (European Commission) asks if there's a role for Natural Gas (NG) in this WG then from a gas turbine point of view ?

Peter Breuhaus (NORCE) answers that he would think so.

Piero de Bonis (European Commission) indicates the EU will launch the new Partnership on hydrogen. It could be taken into account. Where this WG is seen positioning itself with the EU initiatives ongoing and future ?

Peter Breuhaus (NORCE) answers that it depends who is responding to the EU according to each EU initiative. It would fits with some of the ETN's activities.

Christer Björkqvist (ETN) recalls it is the launch meeting of the WG. The objective today is to know the interests of ETN's members, to know where the EU is going forward. Today a mapping process will start to establish the best strategy for the WG and will follow on the second meeting. He leaves the floor to Elisabet Syverud.

Mapping process to discuss and agree on the scope, objectives, and activities - *Elisabet Syverud, USN Campus Kongsberg*

Elisabet Syverud (USN Campus Kongsberg) shares a Miro board, allowing participants to ask questions and provide inputs. An opened discussion is proposed.

Piero de Bonis (European Commission) says that the WG could fit with EU initiatives and encourages it to find the correct links to these initiatives to propose contributions. According to its developments, others colleagues from the EC would participate.

Christer Björkqvist (ETN) asks if there are new calls and opportunities.

Piero de Bonis (European Commission) answers positively. This the case on energy systems and specific technologies. In gas, especially hydrogen amongst renewable fuels, it could be very relevant. Hydrogen is gaining a lot of attraction.

Christer Björkqvist (ETN) says that renewable fuels should be used as they become available. It depends on the blending, the size of the GT, but the objective is clearly to go on renewable fuels.

Emanuele Martelli (Politecnico di Milano) says solutions involving hydrogen production and/or storage are too expensive insofar. It is an obstacle on which the WG should work, proposing incentives from the policymakers towards renewables and hydrogen fuels. The other upcoming issue is defining decentralised energy systems (DES). DES are more about aggregation of more units into the energy market (GT, solar panels and wind turbines). The owner of the power plant decides to provide power generation according to the availability on the market.

Wujun Wang (KTH) states that if the renewable electricity is sufficient to power the hydrogen market, it could be the future for users in Europe. A mix of fuels would be attractive, including GT and its fuel flexibility from 0 to 100% using different types of fuels. KTH develops flexible combustors for mGTs.

Elisabet Syverud (USN Campus Kongsberg**)** indicates that a structure is needed from the inputs in the Miro Board to scope the WG. Every participant should start with their interest joining the DES WG.

Magnus Genrup (Lund University) says that his interest would be on turbomachinery components and particularly on combustion, and their technical application rather than the general energy system a such.

Elisabet Syverud (USN Campus Kongsberg) says that there are two main topics here: the conceptual energy system and the components technical application.

Magnus Genrup (Lund University) precises that with new engine running different fuels, the future will include liquid bio-fuels, ammonia, hydrogen that can have a room into these technological developments.

Christer Björkqvist (ETN) recalls that there is a dedicated WG on hydrogen and ammonia, and that duplications should be avoided with the DES WG.

Marco Sorrentino (University of Salerno) states that DES can play a big role to close the gap between availability of clean resources and the need for automotive OEMs to go as clean as possible. DES can have this role to put together the needs of all stakeholders in renewable energies and hydrogen fields. An intersectoral approach would be recommended. The University of Salerno develops activities on clean micro grids for polygeneration with new decentralised concepts, especially on the costs of RES by managing their uncertainty and producing hydrogen as clean as possible. ETN could support it because GTs can work on hydrogen and others fuels and have a large cogeneration potential.

Elisabet Syverud (USN Campus Kongsberg) finds that a participant person commented on storage opportunities on the Miro board.

David Tomas Sanchez Martinez (Universidad de Sevilla) says that it is an interest in the WG to go on how storage systems should be implemented such as hydrogen storage in a cost effective way along MGts technologies as DES is a new concept.

Elisabet Syverud (USN Campus Kongsberg) finds that a participant person commented on thermal storage on the Miro board. It is about consumption profile or the technology behind thermal storage ?

Peter Knute (DNV) says it is rather on consumption profile and the integration of thermal storage with GTs.

Elisabet Syverud (USN Campus Kongsberg) finds that a participant person commented on thermal systems integration in the industrial processes and asks him to elaborate.

Peter Knute (DNV) indicates that using excess heat in the GT cycle to produce electricity could increase the efficiency of the process during the process running for example in the start-up phase to heat the reactor. This is a sort of decentralised energy production but with some high integration in an industrial process it would gain some efficiency.

Abdulnaser Sayma (City, University of London) wants to understand if the European Commission closes the door on specific technology innovations or that there will be embedded in other components levels or larger projects.

Piero de Bonis (European Commission) needs the question to be clarified : how the efforts should be distributed among component development and system integration ?

Abdulnaser Sayma (City, University of London) says that there are two parts of the questions: is the European Commission focusing on systems levels components or existing technologies innovations or the combination of those ?

Piero de Bonis (European Commission) answers that it is difficult to find a call for specific component or technologies. In Horizon Europe specific targets should be met. In systems integration perspective, some room to components technologies can be given if there are relevant.

Elisabet Syverud (USN Campus Kongsberg) finds that a participant person from a gas turbine OEM's perspective commented on the Miro board on how to define the readiness of a GT for DES.

Maurer Michael Thomas (Ansaldo Energia) says that from OEM's perspective producing attractive products ready DES is on the agenda and asks on what should be done to make those ready (label, features).

Elisabet Syverud (USN Campus Kongsberg) asks if participants would like to share opinions on what DES means.

Wujun Wang (KTH) says that the development of mGTs and flexible combustors could be a good element to integrate with renewable electricity and with storage technologies by focusing on key components that enable flexibility with such energies.

Lars-Uno Axelsoon (OPRA Turbines) indicates that OEMs have similar interest on GTs as a whole role in the future energy landscape. Defining the technologies requirements to position in accordance is necessary.

Peter Breuhaus (NORCE) says that it has started with the ROBINSON project with a sort of energy concept development and resources availability, and the requirements for a CHP. The main idea is the integration and combination of energy systems. That would be the starting point. A general rule would be difficult considering local conditions and constraints.

Emanuele Martelli (Politecnico di Milano) says that defining DES is difficult, with terms such as '*aggregated energy systems, with multiple units or types of units'*. Relevant applications to mGT would include a low power capacity and a limit would be productive.

Peter Knute (DNV) says that it is already possible to integrate energy systems in industrial installations. DES could go further than interconnected small installations. The Combined use of heat and electricity is an example.

Peter Breuhaus (NORCE) agrees and says that in the ROBINSON project the electricity peak demand will be of 3MGwh. Integrate the CHP into that system without putting production in danger and combine with other fuels sources is one of the project goals.

Peter Knute (DNV) adds that systems in the market for DES exist and the **WG could see the need for more flexibility and integration with RES**. There is a possibility **to enlarge DES to others applications** such as large buildings, and to see how those technologies could be available.

Elisabet Syverud (USN Campus Kongsberg) sees a challenge for the gas turbine OEMs and asks why OPRA Turbines is interested in joining the WG.

Lars-Uno Axelsoon (OPRA Turbines) answers that there is **a big untapped potential where mGts can be useful**. The ETN network can add different insights for the industry and how we could use mGts.

Elisabet Syverud (USN Campus Kongsberg) asks how the WG can support **a definition and what are the concrete needs from OEMs (DES size for mGTs and their components**).

Lars-Uno Axelsoon (OPRA Turbines) answers that **mGTs fuel flexibility and fuel cells technologies should be more known by their clients as available on the market**.

Emanuele Martelli (Politecnico di Milano) agrees and says that the reference solution is the internal combustion engine and the size of these energy systems with energy managements systems. The direct competitor is the internal combustion engine which restrains mGTs implementation.

Marco Sorrentino (University of Salerno) says that **microgrids** are very suitable for islanders users and some components such a **reversible fuels cells** can be used then for producing **synthetic fuels, which can be used by internal combustion engine and GTs**. Standalone systems can benefit of a joint use of consolidated technologies in that case.

Elisabet Syverud (USN Campus Kongsberg) finds that a participant from Ansaldo Energia shared also about the OEMs perspective.

Maurer Michael Thomas (Ansaldo Energia) precises and asks what is the vision of DES: **if DES refer to isolated areas or means replacing big clusters by many little ones**.

Marco Sorrentino (University of Salerno) says that islanders cases fit with DES installations in the short term with a cost mitigation and can help to make the technology more mature for massive uses in the grid connection, with digital powerplants.

Emanuele Martelli (Politecnico di Milano) says that plants **have two applications** for the companies: for **rural areas such as islands** or distributed energy systems **on main continent when heat is needed**. It could be used for hospitals in Italy for example (networks of CHP interconnected by the heating network which can sell the excess electricity to the electricity market or buy from it).

Elisabet Syverud (USN Campus Kongsberg) asks if a participant wants to bring a undiscussed topic useful to the WG and recalls to look at the MIRO board. She asks Emanuele Martelli (Politecnico di Milano), Peter Breuhaus (NORCE) and the ETN Team for support preparing the follow-up meeting planned on Tuesday 28th September for 15.00-16.30. She closes the meeting.

Actions list:

#	New Actions	Resp.	Deadline
1	Prepare next meeting	Chair, ETN	28th September