

ETIP SNET

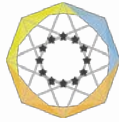
EUROPEAN
TECHNOLOGY AND
INNOVATION
PLATFORM

SMART
NETWORKS FOR
ENERGY
TRANSITION

**PLAN.
INNOVATE.
ENGAGE.**

Working Group 3 „Flexible Generation“

**Dr.-Ing. Michael Ladwig
Chair of Working Group 3**



Specific Objectives of the Working Group

WG 3 addresses the business & technology trends considering

- **the contribution of flexible generation**
- **of all dispatchable generation sources**
- **for power, heat and cooling**
- **centralized and decentralized**
- **with or without embedded storage**

as needed for an integrated energy system.

WG 3 Leadership Team

Chair:

Michael Ladwig (General Electric, CH)

Co-Chairs:

Miguel Garagorri de Miota (Iberdrola, ES)

Pascal Fontaine (CMI Energy, BE)

Advisor:

Vincenzo Casamassima (RSE, IT)

Members:

23 experts out of 12 countries



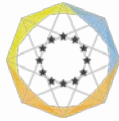
March 30, 2017

1st WG3 Workshop in Milano



May 17, 2017

2nd WG3 Workshop in Brussels



WG 3 Members

FAMILY NAME	GIVEN NAME	Organisation and Position	Country
Bergins	Christian	Mitsubishi Hitachi Power Systems Europe GmbH	DE
Bernstrauch	Olaf	Siemens Power and Gas Division, Technology and Innovation, External Collaboration and Partnering	DE
Bongaerts	Martijn	Liander NV, innovation manager	NL
Breuhaus	Peter	International Research Institute Stavanger (IRIS), Chief Scientist	NO
Brunetti	Iarno	Innovation Program Manager at Enel Produzione	IT
Cammarata	Antonio	Czech Technical University in Prague, Assistant Professor	CZ
Coda Zabetta	Edgardo	Sumitomo SHI FW, Director R&D and Patents	FI
Finkenrath	Matthias	Professor for Energy and Process Engineering, Institute of Energy and Propulsion Technologies, Kempten University of Applied Sciences	DE
Grether	Ralf	Voith Hydro, Head of Marketing Service, Patent and Innovation	DE
Herce	Carlos	Technology Expert at Fuels and Combustion Technologies Group (CIRCE Foundation)	ES
Izquierdo	Carlos	Red Eléctrica de España (REE). Power system engineer at the Electrical System Reliability Department	ES
Jansohn	Peter	Paul Scherrer Institute (PSI), Department Head	CH
Lacariere	Bruno	Professor at IMT Atlantique (formely Ecole des Mines de Nantes)	FR
Minciuc	Eduard	University Politehnica of Bucharest, Associate Professor	RO
Portin	Kaj	Wärtsilä Corporation, General Manager	FI
Rautanen	Matti	Valmet Technologies Oy, Networks Manager, R&D, Pulp and Energy BL	FI
Ruedel	Uwe	Ansaldo Energia Switzerland Ltd; Gas Turbine R&D Technology Program Manager	CH
Stettner	Peter	ANDRITZ HYDRO GmbH, Head of Market Strategy	AT
Strauss-Mincu	Diana	Fraunhofer IWES/ Group leader / Grid Control and Dynamics; DERlab e.V. / General Manager	DE
Wiedermann	Alexander	MAN Diesel&Turbo SE, Senior Manager	DE
Ladwig	Michael	GE Power, Director Scientific Collaboration	CH
Garagorri de Miota	Miguel	Iberdrola, European Affairs Manager	ES
Fontaine	Pascal	CMI Energy	BE

WG 3 Working Process

Bi-Weekly leadership calls

Monthly WG3 calls

F2F-Meetings every 4 months

Involvement of members through »letters»
(tasks)

Proud to have active members



October 06, 2017

3st WG3 Workshop in Madrid



January 31, 2018

4nd WG3 Workshop in Liège

WG 3 Working Process

Contributions to:

- Roadmap 2018-2027
- H2020 Working Programme 2018-2020
- Implementation Plan 2018-2020
- Vision 2050
- Mission 2030

Next Step:

- Position Paper / White Paper:
“Flexible Power Generation in a Decarbonizing Europe”



May 16, 2018

5nd WG3 Workshop in Espoo

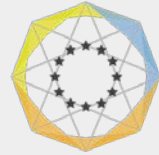
What do we want to achieve?

- understanding the existing energy system in EU (demand & supply)
- providing a forecast on how we see the European energy generation landscape in 2050
- understanding of «flexible generation» (what does it mean?) and its necessity for Europe, its technologies, challenges and future R&D needs (targets)
- explaining definitions and boundaries
- detailing the deliverables of flexible generation
- explaining the economics
- outlining the sector integration
- explaining the contribution of flexible generation to the generation transition and CO₂ reduction

What is the structure of the paper?

Executive Summary

1. Today' situation in the power generation sector in Europe
2. European targets with regard to flexible generation
3. Energy sources (Coal, Gas, Liquid Fuel, Nuclear, wind, sun, wave, biomass, geothermal, water
4. Technologies today (GT, ST, Hydro, Wind, PV, CSP, Gas Engines
5. Challenges
6. Technologies tomorrow (Fusion, Fuel Cells, Nano-Generators, Digitization, Retrofitability incl. fuel switch, short term storage, seasonal storage,)
7. Outlook for a generation in a decarbonizing Europe
 - decisions needed by legislation
 - funding requests (R&D and deployment)
 - road map
 - grid prerequisites
 - infrastructure needs
 - economical consequences
8. Summary



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**On behalf of
WG 3 “Flexible Generation”**

Thank you