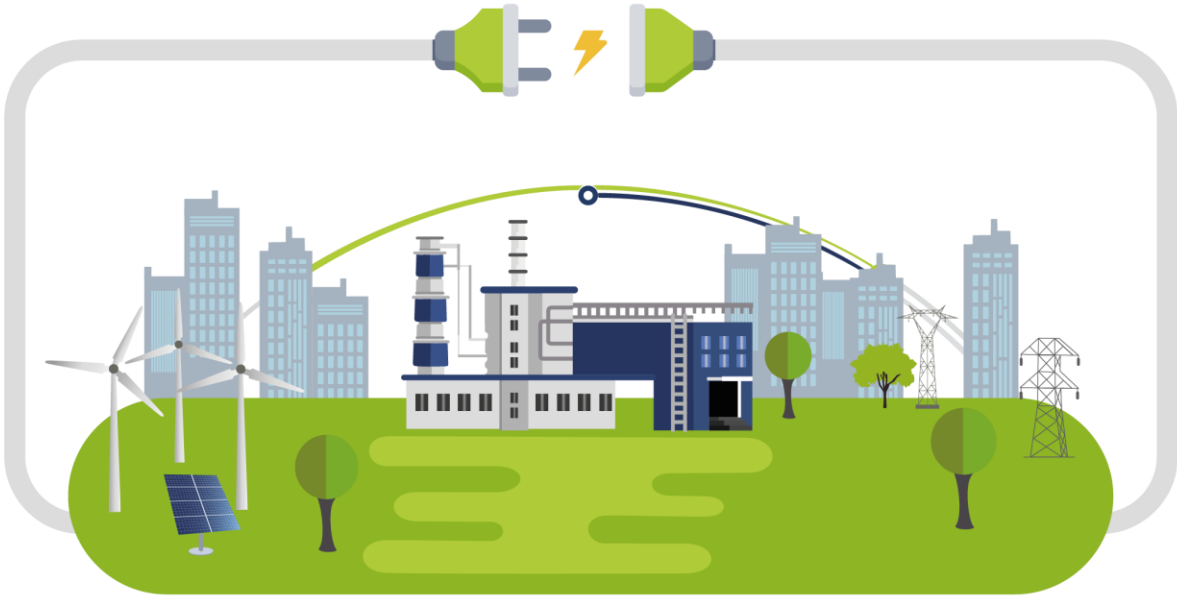
Presentations and Panel Discussion

The future energy system - meeting complexity with flexibility

26th June 2019,

Press Club, Brussels, Belgium



1. Background

Early results achieved by the TURBO-REFLEX, PUMP HEAT and sCO2FLEX projects will be presented to discuss the specific challenges and policy implications related to the reduction of the environmental impact of conventional power plants and the increase of their flexibility and efficiency.

The challenges these projects are addressing are multiple:

- *Fossil fuel power plants will have to increasingly shift their role from providing base-load power to providing fluctuating back-up power to control and stabilise the grid*
- *Plants should be able to run both at the lowest part load possible at the highest possible efficiency*
- *Plants will be required to operate across the entire load range with high load-change velocities*
- *Moreover, plants will be required to operate across the entire load range with high load-change velocities and even operate in start/stop mode with full turndown and very fast re-start, all at minimal (lifetime) fuel consumption leading to increased rate of wear on plant components*
- *Integration into an advanced energy system with ever higher shares of renewable energies for both existing (retrofitting) and new thermal power plants*

TURBO-REFLEX, PUMP HEAT and sCO2FLEX projects have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 764545, No. 764706, No. 764690.

- *Solutions with lowest greenhouse gas emissions, residue disposal and water need per energy unit*
- *Collaboration with power plant operators*

2. The TURBO-REFLEX project

TURBO-REFLEX aims to develop and optimise technologies applicable to a selected set of turbomachinery engine components, which can be used to retrofit existing power plants to reduce costs per cycle, increase low load capability of existing plants and increase load following capability. In a combined cycle plant, the components and technologies which will be improved in TURBO-REFLEX are grouped in the three technology pillars:

- Improvement of compressor off-design operability
- Optimisation of hot gas path technologies
- Mechanical integrity for more flexible operation

These are complemented by new approaches to enable online plant monitoring and analytics and a whole plant performance assessment.

3. The PUMP-HEAT project

PUMP-HEAT integrates heat pumps, thermal energy storage and advanced controls to take advantage of the unexploited energy in power plants. The objectives of the project are to develop an integrated, flexibility-oriented Combined Cycle balance of Plant, the effective development of the advanced blowout preventer (BoP) Components (Phase Change materials storage, advanced Hex, Power recovery in High Pressures), the effective integration via predictive control systems, validation and demonstration of components and overall PUMP-HEAT Combined Cycle (PHCC) layout.

4. The sCO2FLEX project

The Supercritical CO2 Cycle for Flexible & Sustainable Support to the Electricity System (sCO2-Flex) addresses such challenges by developing and validating a scalable/modular design of a 25MWe Brayton cycle using supercritical CO2 that will enable an increase in the operational flexibility (fast load changes, fast start-ups and shut-downs) and in the efficiency of existing and future coal and lignite power plants, thus reducing their environmental impacts. Mitigating fossil fuel plants' environmental impact and foster sCO2 technology's acceptance to reduce water consumption by 100% by avoiding the use of water in the thermodynamic cycle loop/heat rejection section with air cooling and thus enabling geographical flexibility.

5. Objectives of the panel discussion

The panel discussion is envisaged with European policy makers, industry and the energy sector. In this panel, the discussions will focus on: 1) the value of the results achieved so far from the different angles looked at by the 3 projects, 2) Discuss current vs future policy needs to support efforts in these directions, 3) Discuss future projects in the sectors of energy storage as well as retrofitting turbines to use hydrogen.

We expect an overall audience of approx. 40-50 persons, mainly from the industry, the energy sector and academia with press coverage.

6. Preliminary Agenda

Wednesday 26th June 2019		
Time	Item	Speaker(s)
13:00 - 13:15	Welcome note/ Introductory presentation	Daniela Gentile (Ansaldo Energia)
13:15 - 13:30	The role of advanced gas and steam turbines in the future energy system	TBC
13:30 - 13:45	EC/Policy keynote	Mr Siemers (DG Energy)
13:45 - 14:00	The user's perspective	Naturgy (TBC)
14:00 - 14:15	TURBO-REFLEX early results	Dr Christian Aalburg (TURBO-REFLEX coordinator)
14:15 - 14:30	PUMP-HEAT early results	Prof. Alessandro Sorce (PUMP-HEAT)
14:30 - 14:45	sCO2FLEX early results	Dr Albannie Cagnac (sCO2FLEX coordinator)
14:45 - 15:30	Coffee break	
15:30 – 17:00	Panel discussion: the challenges and policy implications of the Energy transition. Moving towards a dynamic energy system that copes with variable energy sources	Mr Siemers (DG Energy) Daniela Gentile (Ansaldo Energia) Dr Christian Aalburg Prof. Alessandro Sorce Dr Albannie Cagnac Naturgy (TBC)
17:00 – 18:00	Networking cocktail	

7. Venue

Press Club Brussels Europe
Rue Froissart 95-99,
1040 Brussels
Belgium
Website: https://www.pressclub.be/event-facilities/

8. Contact details

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