

INTRODUCTION

ETN Global is a non-profit membership association bringing together the entire value chain of the gas turbine technology. Our vision is to accelerate research, development, demonstration, and deployment of safe, secure, affordable and dispatchable carbon-neutral energy solutions by 2030.

ETN Global fully supports EC's efforts in the area of sustainable finance and is committed to achieving the climate neutrality targets. Therefore, we welcome the development of the EU Taxonomy and the underlying Delegated Acts.

The Platform for Sustainable Finance call for feedback on “preliminary recommendations on technical screening criteria for the remaining four environmental objectives” in its Draft Report triggered vast interest within ETN, our members and project partners. We believe that this call for feedback provides an excellent opportunity to share our reflection on the scope of the discussed document.

This feedback is a joint effort of ETN and its project partners in a Horizon 2020 project under Grant Agreement number 101022831 – CO2OLHEAT (*Supercritical CO₂ power cycles demonstration in Operational environment Locally valorising industrial Waste Heat*). This project aims to unlock the potential of industrial waste heat and to transform it into power via supercritical carbon dioxide (sCO₂) cycles. The cutting-edge sCO₂ technologies will be employed to design and demonstrate the EU's first-of-its-kind sCO₂ plant in a real industrial environment, in a high Technology Readiness Level (TRL7).

Besides the project consortium, this feedback is also strongly supported by the following organisations: **Total, ISVAG, Equinor, GTI (Gas Technology Institute), Uniper Technologies Limited, University of Genoa, ArcelorMittal, Greenway Energy, Nooter/Eriksen, Feralpi, SAIPEM, and Turboden.**

Given the minimal environmental footprint of this state-of-the-art technology and the project team's obligation towards the EC to engage in future marketability of the CO2OLHEAT concept, we are convinced that ETN and its partners are in the position to request the Platform for Sustainable Finance to **recognise the activity “Production of electricity using waste heat” as sustainable**. While we think that the best way to do that would be to correct the activity 4.25 in the Climate Delegated Act “Production of heat/cold using waste heat” as “Production of heat/cool **and/or power** using waste heat”, we understand that this is not in the scope of this feedback. Therefore, we wish to recognise this activity under the **Transition to a circular economy objective**.

Please find below our proposal for the Technical Screening Criteria, enriched by several scientific examples (more in documents 1,2 and 3).

We hope that you will find our feedback a valuable contribution to achieving the common goal of a more sustainable environment.

TECHNICAL SCREENING CRITERIA

Description of the activity

Waste Heat To Power (WH2P) is the process of capturing heat discarded by an existing process and using that heat to generate electricity. WH2P technologies can be divided into three categories:

1. Waste heat from a(n) (exo)thermal process – energy can be recovered from a furnace, reactor, oven, kiln and other industrial processes and converted to electricity using a thermodynamic process
2. Waste heat from a mechanical drive (combustion based engines and turbines)
3. Waste heat from other systems (mechanical, electrical conversion losses)

WH2P applications contribute to the transition to a circular economy not only by addressing the negative impacts of the linear economy, but more importantly by the introduction of a systemic shift, introduction of industrial symbiosis and building resilience. Moreover, WH2P applications generate business and economic opportunities, thus increasing companies' competitiveness and providing environmental and societal benefits.

It is very relevant to mention that industrial processes are currently responsible for nearly 26% of the European primary energy consumption and are characterized by a multitude of energy losses. At the same time, the potential of EU waste heat is enormous: *(theoretical waste heat recovery potential in the EU industry is almost 920 TWh, while Carnot's WHR potential amounts to nearly 280 TWh – see document 1).*

Economic activities that produce power using waste heat could be associated with NACE code D35.1 in accordance with the statistical classification of economic activities established by Regulation (EC) No 1893/2006.

Substantial contribution to transition to circular economy

Production of electricity using waste heat demonstrates its Substantial Contribution by its own performance by "Improving the state of the environment", therefore leading to a positive environmental impact. Power generated from waste heat technologies is carbon-neutral: no additional CO₂ emissions are produced for the new energy carrier originated from waste heat, and it can be considered as clean as renewables.

(Research shows that 1 MWh of thermal energy recovered would avoid 0,202 tons of CO₂ emitted in the atmosphere – see document 1).

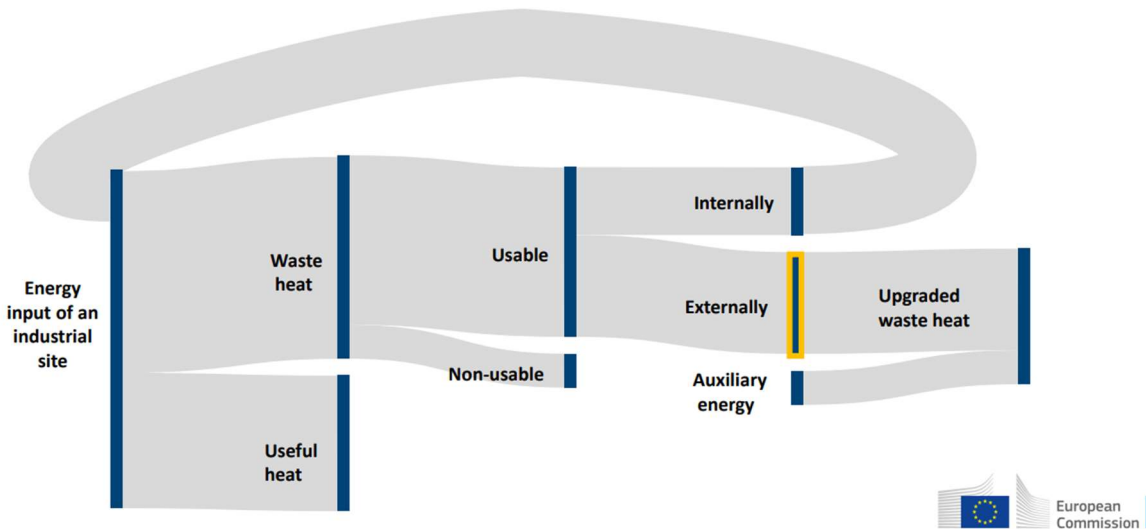
WH2P activity qualifies as contributing substantially to the transition to a circular economy, as this activity:

- reduces the use of primary resources to produce electricity;
- increases the efficiency of the electricity chain (production & transportation) as the generated electricity is typically re-used at the local industrial process;
- reduces the amount of primary resources (like water and electricity) to cool down the waste heat flow from industrial processes;
- can work in perfect symbiosis with fluctuating (seasonal, economic) heat demands from a city- or industrial heat network;

- can contribute to higher electrical grid stability (increasing challenge by an increasing renewable share) by facilitating local, baseload or flexible decentralised electricity production;
- always leads to a mind shift in organisations and a more sustainable process integration.

The WH2P applications contribute to Substantial contribution 3 – Circular Value Recovery via the waste heat valorisation.

The below scheme (from JRC Technical Report “Defining and accounting for waste heat and cold, authors Lyons, L., Kavadias, K., Carlsson, J.- 2021) identifies the circular use of heat flows, both internal (on-site) and external (off-site) ones:



Do no significant harm ('DNSH')

- (1) **Climate change mitigation:** This activity does not increase GHG emissions (as per the environmental assessment of this concept via a life cycle approach and in accordance with ISO 14044).
- (2) **Climate change adaptation:** The activity complies with the criteria set out in Appendix A of Annex 1 to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.
- (3) **Sustainable use and protection of water and marine resources:** n/a
- (5) **Pollution prevention and control:** Pumps and the kind of equipment used, which is covered by Ecodesign and Energy labelling comply, where relevant, with the top class requirements of the energy label laid down in Regulation (EU) 2017/1369, and with implementing regulations under Directive 2009/125/EC and represent the best available technology. WH2P solutions are ecological and more performant than electricity from classic combustion-based power stations. The higher the electrical validation of waste heat, the lower the production necessity from combustion-based power plants and the potential pollution by such power plants.
- (6) **Protection and restoration of biodiversity and ecosystems:** The activity complies with the criteria set out in Appendix D of Annex to the Commission Delegated Regulation (EU) .../... supplementing Regulation (EU) 2020/852.