

ZEP Flagship Program

Background

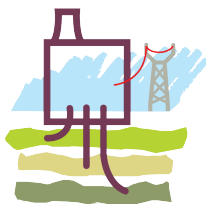
At the meeting of the ZEP Coordination Group on 23rd January 2007 the following was stated:

"It was recognised that Europe needs greater visibility to its actions in this arena (Zero Emissions Power). To this end ETP ZEP will develop a proposal for a "EU Flagship Programme".

This idea came out of an informal discussion with the European Commission involving both DG/TREN and DG/RES where the need for a strong visible focus for zero emission fossil fuel power plant in Europe was identified.

A small taskforce was therefore established to address the issue and comprised of Graeme Sweeney (Shell), Arve Thorvik (Statoil), Johannes Heithoff (RWE), Gardiner Hill (BP), Nick Otter (ALSTOM) with involvement from Robert van der Lande (Secretariat). This note is a proposal for such a Flagship programme, that has been developed by the Taskforce for presentation and discussion with the ZEP Advisory Council (AC).

It is clear to industry that the technology for zero emissions fossil fuel power plants is sufficiently well developed for plants to compete effectively with other forms of low carbon power technologies. The technology is available today but as detailed in the SRA document, further technology R&D is required to reduce the cost and reduce the energy efficiency penalty. However demonstration of this pre-commercial technology is essential at large scale, as mentioned in the SDD, to learn and help provide direction for further technology development. Industry is ready for the next step: to move ahead with full scale integrated plants. What is missing is concrete policy measures that create the conditions and stable business environment that business needs in order to make the large investment and offset the higher costs of Zero Emissions plants. This is why the SDD recommended that the next step was to move ahead with full commercial scale integrated plants and to urgently establish policy mechanisms (at EU and member state levels) that will enable this. This has now been accepted by the European Council, and the Commission has been urged to go ahead. The absence of these measures



will have a detrimental effect on the present momentum towards ZEP-plants and the EU target to have all fossil fuel power plants zero emissions by 2020.

Scope and objectives of the flagship program

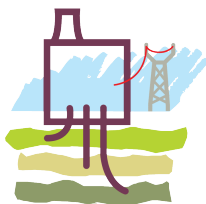
It is proposed to focus the scope of the ZEP flagship program to a series of demonstration and first-of-a-kind ETP-ZEP plants that will be in place and operational by 2015, as now decided by the EU, ("to bring environmentally safe carbon capture and sequestration (CCS) to deployment with new fossil-fuel plants, if possible by 2020."). The ZEP Flagship Programme will be on the "critical path" to reach the EU goal of full commercial deployment of ZEP by 2020. The flagship program is composed of 10-12 full scale commercial plants that are on this critical path of commercial development of the ZEP-technologies for the major market/technology combinations¹. As each of these demos will cover specific parts of the value chain (capture, transport, storage) the demos together will make the convincing case for wide scale deployment of ZEP-technology. This can not be achieved by the individual projects alone. Work is now ongoing to bring the next level of detail that will clearly determine how we propose to cover all of the technology issues in the demonstrations being undertaken in the Flagship Programme.

Hence in the context of reaching full commercial readiness by 2020 and to have all Flagship plants up and running by 2015, a number of critical activities must be included in the program.

The objectives of the Flagship Programme are as follows:

- Demonstrate at large scale, integrated ZEP projects which utilize different fuel types (e.g. gas, pet coke, coal) different CO₂ capture technologies (e.g. pre-combustion, post combustion and Oxy firing) and different geological storage sites (e.g. depleted Oil and gas fields, EOR/CO₂ Storage, Deep unmineable coal, saline water reservoirs, etc)
- Encourage a geographic spread of the projects
- Develop mechanisms at an EU level for partnerships to bring about these projects, and incentivise member states to create policy mechanism in 2007 so that Flagship projects can be sanctioned and constructed to meet the target of having all Flagship plants up and running by 2015

¹ The taskforce Demonstration and implementation will in the next few weeks develop the framework for the 10-12 demo plants on the critical path



- Gain and build experience in the cost of full scale ZEP for different fuels, technology and storage combinations
- Gain experience in the operational and energy efficiency aspects of large scale integrated systems
- Use the experience to inform the development work required to determine the appropriate regulations required in a ZEP world
- Use the experience to determine the appropriate long term policy strategy and mechanisms appropriate to enable full scale commercial deployment post 2020
- Learn by doing, building European experience and capability in this important technology and positioning EU firms as market leaders in technology with export potential
- Use the Flagship Programme to demonstrate confidence in the technology by politicians and the public at large across Europe.
- Provide EU leadership that will enable the EU to fully engage with other parts of the world, including the USA and China in reducing CO2 emissions and in particular the readiness of CCS technology.

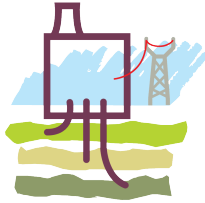
Given the above objectives, the number of demonstration plants needs to be determined and clarified for the Flagship Programme (10-12 were proposed by ZEP TP). The European Council last week welcomed “the Commission’s intention to establish a mechanism to stimulate the construction and operation by 2015 of up to 12 demonstration plants of sustainable fossil fuel technologies in commercial power production.”.

Also it is proposed that the Flagship Programme is a vehicle that the EU can use to work internationally to engage others in ZEP. Together with establishing plants in Europe there is an opportunity to extend the Flagship Programme internationally with the USA, China and India.

All activities that link to the other 8 recommendations of the SRA/SDD elements of the ETP-ZEP activities are regarded as complementary to the Flagship Programme and should be developed accordingly.

The proposed name of the program

The proposed name of this is; “ZEP Flagship Programme”. This way the Programme can be clearly seen as to be part of the EU ZEP initiative being taken forward by the ZEP TP. Engagement and support by the different DGs of the EC will be an important aspect, as will be the link to the Member State governments, especially in the light of the Spring 2007 EU Council of Ministers.



Relationships and Accountabilities

In order for the ZEP Flagship Programme to be successful we must establish the necessary close working relationship between the Flagship Programme the ZEP TP, DG RES, DG TREN and DG Environment, as well as member state governments. Bringing clarity on accountabilities, ownership and on establishing these relationships is an urgent next step and a project plan will be required to manage the Flagship Programme effectively.