

## Position paper towards a North Sea Energy System Integration Triple-Helix structure

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### ENSEA's mandate

One of the ENSEA targets is to initiate so called enabling (lighthouse) themes, i.e. joint activities that typically relate to triple helix conditions for integrated joint investment activity in and around the North Sea area. A clear example of such a theme is: "setting up frameworks for energy cluster development and associated coordination and collaboration of various energy innovation related activities at the official level and/or under the auspices of the energy triple-helix cluster organisations of the various North Sea regions." (see also European North Sea Energy Alliance – working together to create a sustainable and secure energy future, 2014, page 9).

In the following a first step will be taken, in the spirit of the above, to try to initiate with the help of others a triple-helix organisation structure covering the whole North Sea area. Although in various countries around the North Sea, local, regional and even state-level triple-helix energy organisations have been set up, they primarily have remained national, that is to say concentrated in one specific country. Clear examples are the ENSEA partners. At the same time a number of more international organisations, initiatives, stakeholder groups, networks etcetera have emerged lately with a clear focus on the North Sea area (see also next).

What, however, seems to be missing is a solid North Sea based organisation structure with a triple-helix character and dealing with the main energy and energy transition challenges of the North Sea region as a whole. Given the complexity of the energy system developments in and around the North Sea and the strategic role of it in the overall EU energy system, it seems that many challenges related to investment, governance, regulation, research, etcetera would require an organisation overseeing the complete energy system, and able to play a strategic information role, coordinating role, and possibly advisory or, ultimately, even decision making role. ENSEA sees it as part of its mandate to consider how a beginning could be made with setting up such a North Sea triple helix organisation.

### Existing structures

Various organisations do exist with a clear focus on the North Sea area. At the official level there is the North Sea Commission, which is a cooperation platform for regions around the North Sea (<http://www.northsea.org/>). Their mission is to further partnerships between regional authorities which face the challenges and opportunities presented by the North Sea (see also their charter of June 2013). The North Sea Commission is part of the wider EU peripheral maritime regions' network CPMR (Conference of Peripheral Maritime Regions of Europe; [www.cpmr.org](http://www.cpmr.org)) covering some 160 regions from 28 EU states.

Another example of a formal initiative is the 'North Sea countries offshore grid initiative (NSCOGI) (<http://www.benelux.int/nl/kernthemas/energie/nscogi-2012-report/>); see also their MoU of December 2010. This initiative covers ten EU countries, the European Commission, the various related TSO's for electricity, and national regulatory authorities and the Agency for the Cooperation of Energy Regulators (ACER). Its objective is to facilitate the development of offshore and onshore power grids and to maximize the potential of renewable energy in the North Sea area. Under guidance of the Benelux secretariat three working groups discuss various aspects of offshore infrastructure, market and regulation, and planning and permitting.

At the intergovernmental level also the Pentalateral Energy Forum covering the Benelux countries Germany and France has been initiated as a temporary initiative to enhance the cooperation between all relevant parties in order to create a regional Northwest-European electricity and gas market as a step towards one common

European energy market. Although the regional focus of the Forum is clearly wider than the North Sea area only, North Sea issues could definitely be subject of the Forum's discussions.

Overseeing the three initiatives at the official level, it is clear that coordination between national and regional authorities on North Sea energy issues is growing. The organisations, however, although having a clear eye for other stakeholders, cannot be seen as triple helix organisations.

At the industry level also a number of initiatives have been taken to support information, coordination and collaboration on North Sea energy issues. A first example is the European Wind Energy Association (EWEA), although with, again, a much wider regional scope than the North Sea area alone. This organisation is essentially an industrial lobby organisation to support onshore and offshore wind energy activity. Another industrial lobby organisation that could also deal with North Sea energy is 'Friends of the Supergrid' (FOSG). This group sets out to promote and influence the policy and regulatory framework to enable large scale interconnection in Europe. Another organisation with a strong industrial base is NORSTEC. This is a network that brings together a wide range of key players in the offshore renewables sector (mainly industrial but also including research, consultancy and other stakeholders) who recognise the enormous opportunities offered by the northern seas' offshore wind and marine potential. NORSTEC signatories agree to work together to address shared challenges and will play a key part in helping to fully realise its potential.

These examples illustrate that also industry seeks to work together on North Sea energy issues, however, generally without strong links with the research community and official authorities. Sometimes the initiatives have a strong national focus, one of the clearest examples being NOGEPa, which is a Netherlands based organisation dealing with the North Sea gas and oil exploration interests. Various active exploration companies are member of this organisation.

The research and consultancy world meanwhile also initiated their own North Sea energy related networks, usually in a rather informal manner, and often also meant to interest the industry for involvement in the hope to enhance procurement chances and research contracting. Examples are the North Sea Offshore and Storage Network with a strong focus on renewable energy research; the North Sea Grid, a consortium of six consultancy organisations collaborating on research and studies on the offshore electricity grid implementation (endorsed by NSCOGI); or the North Sea Power to Gas Platform, a joint body of some ten organisations (consultancy, network organisations and industry) aiming to explore the viability of power-to-gas in the countries surrounding the North Sea.

Although the above three initiatives are just examples of consultancy/research community increasing interest in North Sea energy issues, collectively they show that the awareness about the need to work together on the complex North Sea energy issues seems to be growing rapidly, probably based on the notion that the North Sea is rapidly developing into an energy hotspot.

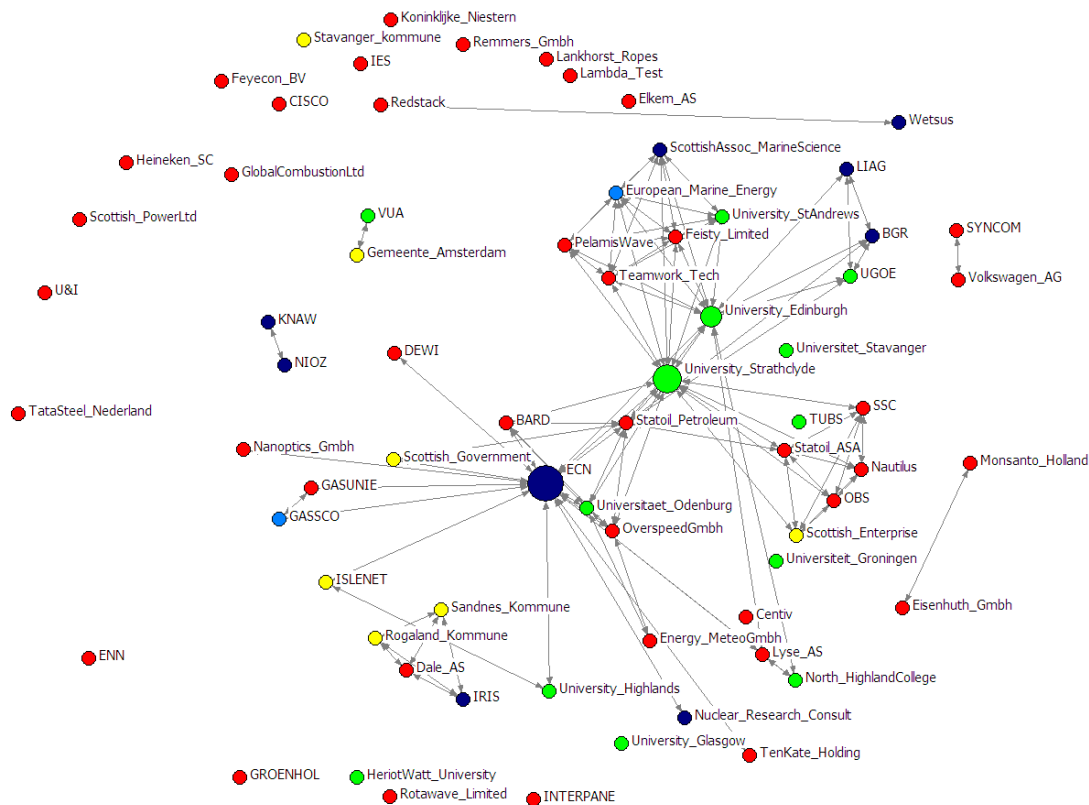
The consultancy and research community's initiatives, however, seem on average also to lack good connections with the official authorities and sometimes also industry.

In short there seem to be many North Sea related initiatives from many groups and organisations, but nothing really with a true triple-helix structure.

### Social Network Analysis

Although the various formal and informal organisations as listed above give some illustration of the coordinating activity and network formation going on, obviously all kind of other formal and informal contacts are continuously established between the various North Sea stakeholders. One way to get some impression of central players and various connections in the overall system of social and economic relations between

individuals and groups, is to construct a so called Social Network. Looking at the ENSEA stakeholders only, we performed a preliminary Social Network Analysis (SNA) for illustration purposes in order to show how a graphic overview can be constructed of the collaboration between ENSEA stakeholders in energy research projects. This sheds some light on the main nodes in the network, in terms of organisations but also of types of stakeholders. This figure is presented hereafter but not without the caveat that the figure has little inclusion of Germany or the other non-ENSEA regions. Also the focus in this SNA is quite strongly on the research network, which may explain why various energy based triple-helix organisations are not (yet) included in the figure. Still the figure does illustrate the complexity of the networks and the various positions taken by stakeholders included.



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### Towards a North Sea triple-helix energy structure: mission and raison d'être

This paper starts from the assumption that the various North Sea energy related initiatives so far need to be better integrated in order to prevent a myriad of stakeholder and official initiatives with huge risks of overlap or even incompatibility. It would be a major step forward if a serious number of them could somehow be integrated into one powerful, interdisciplinary and most of all a triple-helix type of organisation.

Within the ENSEA project therefore a set of discussions will need to be organized to see if and to what extent the various organisations like the ones mentioned above and others interested are really prepared to make further steps towards such integration, or, in fact, a new organisation.

Such a new organisation would clearly need to be triple-helix, not only in terms of governance and funding, but also in its mission and in the set of its programs initiated for e.g. the next year, or the next five or ten years respectively.

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<sup>1</sup> Technopolis Group, *Consultancy support to provide metrics on the capabilities and connectivity of four research driven energy clusters*, 9.

Also it should be clear from the beginning that the new organisation has the mission to enhance North Sea Energy Systems Integration, and to establish links between: the fossils and renewables; gas and electricity; market, grid, storage and regulation; upstream, midstream and downstream; and technological and behavioural aspects.

However, without a clear distinguishing focus, ENSEA 2.0 runs the risk of getting nowhere by going everywhere. One of the key areas in and around the North Sea area that seems to require considerable intermediation and triple-helix coordination for substantial progress is to link the new renewable, mainly offshore wind energy production investment activity with the traditional North Sea oil and gas offshore activities and the energy transition-related activities (e.g. chemical industry, mobility, built environment) in the surrounding North Sea coastal areas. By doing this the purpose is to create synergies, higher efficiencies and cost savings.

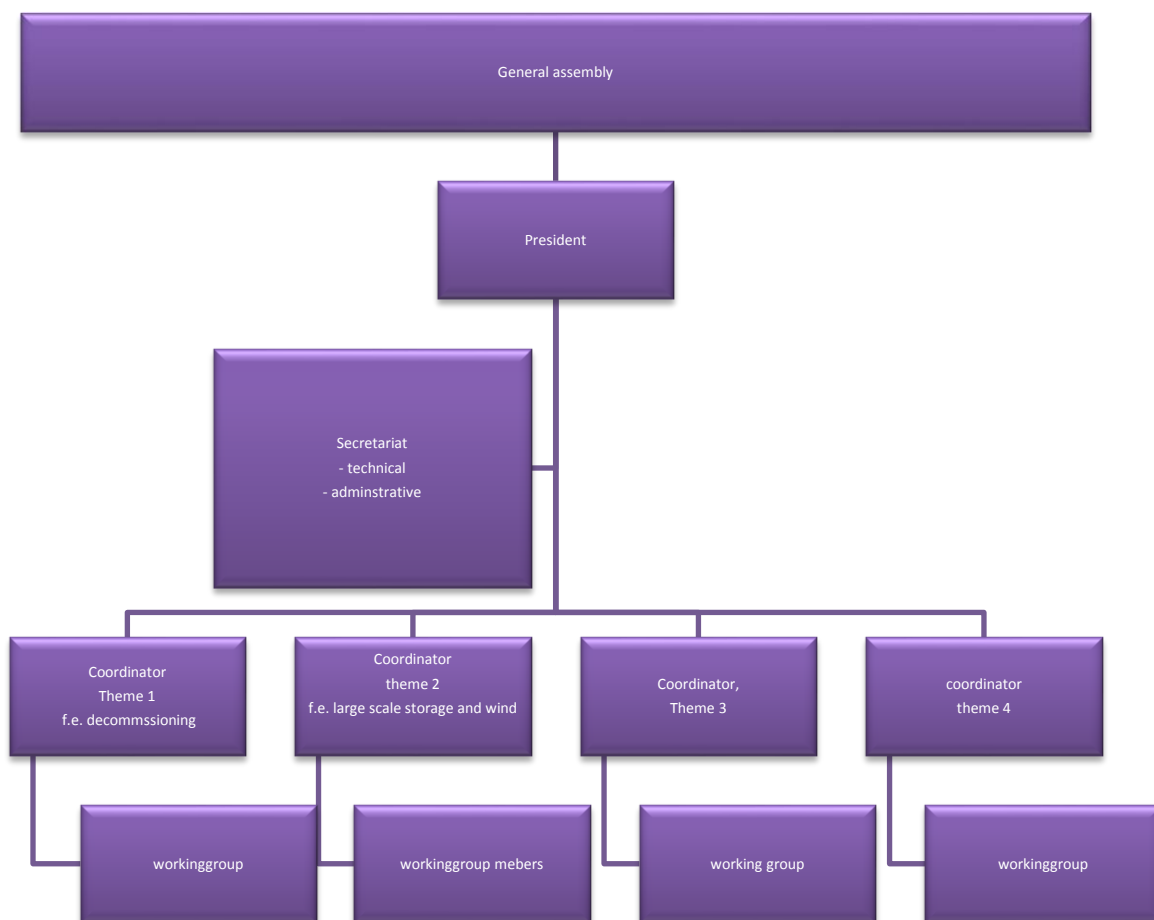
It is clear from the various projections that investment in offshore wind activity in and around the North Sea is only in its infancy, but is likely to grow massively involving multi-billion investment amounts during the next few decades. Some projections even suggest investment figures surpassing one hundred billion euros. At the same time much of the currently existing oil and gas (O&G) exploration activity on the North Sea will start to disappear, which requires very significant decommissioning investment, probably amounting to monetary figures in the order of some fifty billion euros or more. Finally energy transition related activity around the North Sea is booming almost everywhere, as has clearly been illustrated in the overall ENSEA regional analysis, and again involves new investment activity in the dozens of billions of euros for the next few decades.

An example may clarify the scope for cost savings if the different stakeholders succeed in working together properly. Because somehow the offshore wind energy will need to be brought onshore, a formidable infrastructural challenge emerges to convert, store, and to transport that energy. The investment costs of an electrical grid for dealing with the new renewable intermittent North Sea energy supply are formidable, as are the related balancing and back-up challenges. Various ideas are now floating around suggesting that the traditional infrastructure – the O&G platforms and installations and the storages and grid connecting them with onshore activity – can play a crucial role in supporting the efficiency and return of the upcoming offshore wind activity if wind energy can be converted and stored in other forms. Examples are that offshore wind farms convert the electricity generated into other forms of energy (hydrogen, methane, syngases, chemical substances, heat, compression, etcetera) when electricity prices are low or even negative, in order to convert and store that energy for sale later on, and do so by using the existing platforms for conversion and storage, and the existing grid for transport purposes. Such synergy between the old fossil and the new renewable energy worlds at the North Sea could create substantial cost savings and have serious positive safety and public acceptance impact, but requires serious intermediation and coordination. That is typically what ENSEA 2.0 could strive to accomplish. Other examples could be given, such as linking offshore wind to hydro storages, linking offshore wind to bio based chemical activity, linking renewable sources to modern forms of mobility (e.g. hydro or electric) etcetera. All these cases of integration of usually quite separate energy systems can only come off the ground if supportive organisations will play an active role in bringing the various stakeholders together, in establishing links between the various “energy worlds”, and in demonstrating by solid studies and research what the cost savings and efficiency impact of such collaboration can be. That is precisely what ENSEA 2.0 should focus on.

In other words, a distinguishing mission of ENSEA 2.0 could be to reconcile the upcoming renewable, mainly offshore wind energy production activity and the various new energy activities around the North Sea with the traditional O&G exploration activity and related infrastructure use, in order to create synergies, higher efficiencies and cost savings, and possibly to better meet issues of public resistance, regulation and licensing.

Towards a North Sea triple-helix energy structure: organisational aspects

The new organisation in fact could be seen as the formal follow-up of ENSEA (but would obviously not need to carry the same name). It seems obvious that if such an organisation could come off the ground, much of the existing organisations mentioned before would be given the opportunity to join in order also to broaden the coverage of the various regions involved. As a start the new organisation, in the following to be called ENSEA 2.0, could be set up in a relatively light legal form, either as a foundation, or as an association, a company, or perhaps another form. Which format will be optimal to start with will a.o. depend on the anticipated targets, structure, design, budget, mandate and managerial scope of the desired organisational form. For some preliminary thoughts about a possible organisational structure of ENSEA 2.0 to start with, see the following graphical illustration:



With regard to the organisational setting on the medium and longer term, the target could be to turn the ENSEA 2.0 organisation into a formal Public Private Partnership (PPP) in accordance with the EU system. The EU distinguishes in this regard between two PPP forms: a contractual PPP and an institutionalized PPP, the latter also being called Joint Technology Initiative (JTI). Both are partnerships initiated and led by industry, and based on a contractual agreement between the European Commission and the industry partners involved. Such a contract sets out: objectives, commitments, key performance indicators and outputs to be delivered. A contractual PPP, however, is a less far reaching organisational structure than a JTI, which is why the former usually precedes the latter. Whereas a JTI has a fully earmarked budget, a clear theme, shared management

costs, no commitment, requires stronger involvement of industry partners and derogations of the Framework Programme, a contractual PPP instead only involves an indicated budget, an industry proposed strategy and commitment, but implementation by the EC, and requires the usual Horizon 2020 commitment and rules for participation. Either way, both options require a lengthy preparatory process which is why, as argued, they probably are typical options for the medium and long term.

The new organisation should – as an initial thought - be a legal entity initiated by the ENSEA underlying triple helix organisations, and needs to be well-structured organisation-wise, and would have an own budget based on contributions from the various participants (official authorities and the industry could be asked to contribute financially, public research institutes in kind as an option), and a clear mission and mandate.

Finally, the new organisation should be able not only to collect the various studies and research activities relevant for the North Sea energy system, but also to initiate new activities that would be needed for energy systems integration. The mandate of such new initiatives could range from: organising stakeholder meetings and discussion platforms, and formulating policy advices and lobbying, to supporting the setup of new projects and taking responsibility for the execution of triple helix integrated energy systems projects. It would seem important that this organisation also directly reports not only to all stakeholders involved, but also to the European Commission and the various national governments.

#### A first next step

In order to investigate if and to what extent the key representatives of the main North Sea initiatives as mentioned above are willing to collaborate or even merge and under what conditions, ENSEA would need to take the initiative to set up a major workshop to which most of the key stakeholders of the above mentioned organisations would be invited. That workshop would address just one single question: “is there a need for a strong interdisciplinary triple-helix North Sea energy organisation focusing on energy systems integration, and are the existing organisations prepared to join such an initiative?” In order to be able to get some concrete conclusions and results by the ENSEA end conference in Scotland in September 2015, this integration workshop will have to take place well before that date, and should preferably be preceded by bilateral exchange of views.