



**NEW ENERGY
COALITION**

**Annual Report
2018**

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Foreword

This is the 2018 Annual Report of the New Energy Coalition.

New Energy Coalition was formally launched on 1 January, 2018, following the merger of Energy Valley, Energy Academy Europe and Energy Delta Institute. This report covers the first full operating year of New Energy Coalition.

New Energy Coalition wants to contribute to a sustainable energy future and to the development of the Northern Netherlands as a leading, dynamic energy region. It initiates, facilitates, co-ordinates and implements programmes and projects and acts as the central pivot in an extensive partner network as driving force and discussion partner that brings organisations together.

A solid foundation was laid this year - organisationally and programmatically - for the future of New Energy Coalition. This foundation is based on a rich portfolio of projects, initiatives, activities and events that we initiate and implement together with our partners.

This document reports on this and we hope you will find it an enjoyable read!

The Management of New Energy Coalition



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About New Energy Coalition

The mission of the New Energy Coalition is to make a substantial contribution to the energy transition at national and international level.

How are we going to achieve that?

The activities of New Energy Coalition can be summarised under the heading Innovation and Education:

- Innovation: knowledge development through fundamental and applied research, business development and (pilot) projects and
- Education: sharing knowledge through regular secondary vocational education (MBO) - higher vocational education (HBO) - university level education (WO) and training professionals through EDI, the New Energy Coalition business school.

In addition, in order to achieve the ambitions regarding the energy transition, the triple helix partners - industry, science and government - must work together to achieve breakthroughs in research, applications, trade and open innovation.

New Energy Coalition offers organisational capability and support to enable such activities, including:

- Developer of (research) projects (process, financial, knowledge broker)
- Executor of studies and projects (content, process, financial)
- Advisor and driver of market initiatives (content, process, knowledge broker, innovation and financing strategy)
- Driver and promoter of educational offerings (process, co-ordination, knowledge broker)
- Organiser of courses and training (content, process, sales)
- Promoter of transition opportunities (communities, events, media).

See: appendix A for 'the year at a glance in Key Performance Indicators (Dutch).



The Energy Valley Region

New Energy Coalition is firmly anchored in the Energy Valley region, which consists of the three northern provinces Drenthe, Friesland, Groningen and the Noord-Holland North region.

Knowledge and innovation come together in the Energy Valley region, and applications are tested. The area is a "living lab", a testing ground for national and international developments. The region is a leading link in energy knowledge and activity in North-Western Europe.

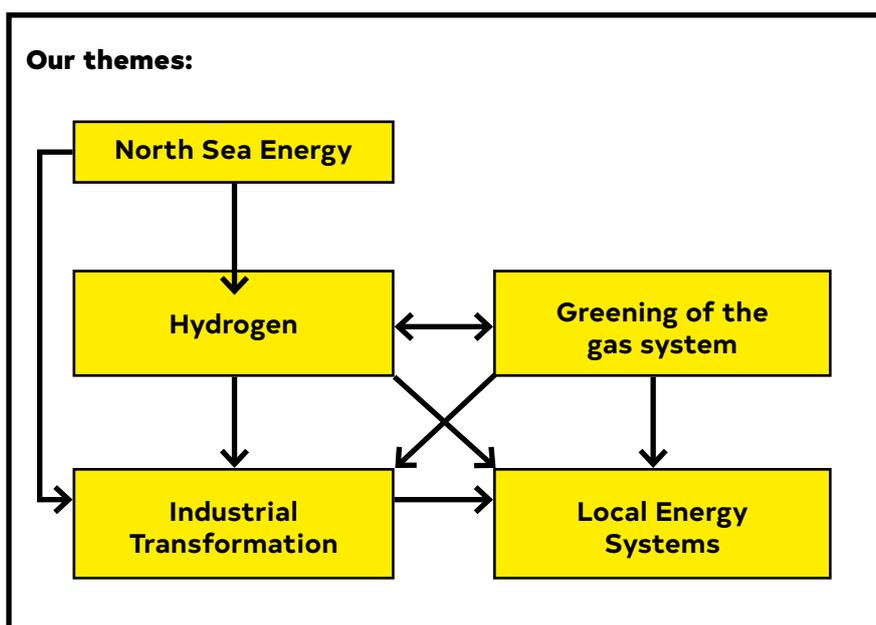
The short lines to neighbouring Germany and other countries around the North Sea are obvious.



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Themes and activities in 2018

There is a partial overlap between the five themes that New Energy Coalition focuses on, consequently they reinforce each other and contribute jointly to a robust energy system. Partners are closely involved in our activities. At a strategic level, there is consultation with the partners in order to achieve an integrated portfolio of activities and to work together on the implementation of concrete projects.



The ambition of New Energy Coalition is to build up its own knowledge position and profile on the five themes with activities for the short, medium and long term. This requires an interdisciplinary and coherent approach with a complementary portfolio of activities related to the themes. We are working on the integration of research, business development and educational activities. After all, this is where the added value of pooling resources within New Energy Coalition lies.

Note: the activities described in this document are an abridged version of the original, Dutch version; the list gives an impression and some areas have not been covered exhaustively for the sake of readability.

2.1 North Sea as Energy region

What does New Energy Coalition want to achieve?

Its location and limited depth make the North Sea ideal for large-scale wind energy production, which is crucial for the sustainability of the energy system in North-Western Europe. Various studies and plans show that the North Sea has enormous potential for large-scale wind power: up to dozens of gigawatts. Developing this potential requires careful spatial integration and smart solutions for multiple use of space and the use and re-use of existing infrastructure, also in an international context.

Furthermore, it must also be possible for the energy system to absorb the large quantities of green electricity. Conversion of electricity from wind power to hydrogen by means of electrolysis can play a key role in this. This technique seems to be very suitable for storing, transporting and using large quantities of sustainable energy in industry and transport.

New Energy Coalition's Focus

The emphasis of our activities is on combining the strengths and expertise needed to perform a further roll-out and strengthen the position of the North as a development region for offshore wind. Special attention is paid to the development of shared study, research and development projects in the field of smart spatial integration, national and international co-operation, links to the topic of hydrogen and re-use of existing infrastructure. In general, we support the lobby for a positive decision on the development of offshore wind power.

Education and training activities

- 3rd Wind Meets Gas symposium
- 1st "Masterclass in North Sea Energy" by EDI/NEC Business School
- 1st learning community by EDI/NEC Business School for RUG/FEB
- Dual lecture Energy Academy Programme
- Offshore energy in collaboration with NAM

Activities in 2018

In 2018, a solid foundation was laid for the "North Sea Energy" programme with various new projects and activities in all disciplines: research, business development and education/training. This further expanded the knowledge position with a direct link to the topic of Hydrogen.

- **North Sea Energy (NSE) programme: launch of "NSE 3"** - see also:

<https://www.north-sea-energy.eu/> ←

- **ENSYSTRA (Energy Systems in Transition Innovative Training Network)** - training programme for 15 PhD researchers - see also: section 4.2 and <https://ensystra.eu/> ←

- **ERIG (European Research Institute for Gas and Energy Innovation):** launch of North Sea working group led by NEC's Professor Catrinus Jepma

- **Havenschets:** the role of ports in the energy transition concerning the transit of offshore wind power (in molecular or electronic form) to the hinterland.

- **IJvergas:** feasibility study into the potential of hydrogen and CCS on a multifunctional island. NEC is the work package leader of the techno-economic analysis, see also: <https://projecten.topsectorenergie.nl/projecten/feasibility-system-integration-gas-wind-energy-island-ijmuiden-ver-00032947> ←

- **DeCommTools:** INTERREG project relating to the setup of a decommissioning value chain for the wind industry, with the emphasis on the recycling value chain.

2.2 Hydrogen

What does New Energy Coalition want to achieve?

Energy consumption in Western Europe is currently split between roughly 25% in the form of electricity and approximately 75% in molecular form. Several studies have revealed that one of the great opportunities for large-scale greening of the molecules lies in the use of ("green") hydrogen.

Green hydrogen can make a significant contribution to the greening of industrial processes (industrial transformation) and the gas system. There are also promising applications for greening transport and mobility. Until large-scale production becomes a reality, the production of "blue hydrogen" (the production of hydrogen using natural gas as a basis, combined with the capture and storage of CO₂), is a necessary interim solution.

New Energy Coalition's Focus

New Energy Coalition supports the development of the hydrogen economy in a broad sense - including the technical and business development aspects, the associated infrastructure (pipelines, storage, etc.), relevant legislation and regulations and applications within industrial processes and mobility. Our role in this is to conduct research, collect factual material, bring together various stakeholders and partners and knowledge partners and support lobbying activities.

An important development that brings all of this together is the initiative to create an integrated hydrogen plan for the north of the Netherlands (a "Hydrogen Valley"), in order to stimulate regional development and related employment.

Activities in 2018

In 2018, significant steps were taken to expand the Northern Netherlands into "Hydrogen Valley". An important instrument here is the European Commission's so-called Fuel Cells & Hydrogen Joint Undertaking (FCHJU). New Energy Coalition is also actively involved in a similar development in the "Northern Randstad". Furthermore, SNN NIA has supported various SME innovations in the field of hydrogen and, at the request of the province of Drenthe, a programme has been developed to implement the green hydrogen chain in Drenthe. A meeting was also organised during the COP24 in Katowice (Poland) to add international strength to the North's ambitions as a "Hydrogen Valley".

- **Ad van Wijk, Professor of Future Energy Systems at TU Delft**, has been appointed as "Hydrogen Ambassador" for the Northern Netherlands at NEC.
- **Green Hydrogen Booster:** design and implementation of research and innovation projects with SMEs, an application prepared in 2018 as part of the SNN Open Innovation call.
- **TSO2020 (the EU's CEF-Synergy programme) - see also:** <http://tso2020.eu/> 
- **ITEG (Integrating Tidal Energy into the European Grid) - NEC's partnership, see also:** <http://www.emec.org.uk/press-release-e11-million-iteg-project-to-integrate-tidal-power-grid-and-hydrogen> 
- **DUWAAL:** organising the supply and demand of hydrogen in the North-West of the Netherlands, DKT application for a hydrogen filling station in the province of Noord-Holland, see also: <https://hy-gro.net/en/duwaal> 

2.3 Local System Integration

What does New Energy Coalition want to achieve?

Three challenges to achieve a sustainable, reliable, safe and affordable energy system:

1. Increasing energy efficiency and controlling the end user's energy demand;
2. Guaranteeing sufficient energy generation and a stable and secure energy infrastructure; and
3. Acceptable proposition for all parties involved within the energy system, in which the costs and benefits are distributed fairly and there is sufficient support.

New Energy Coalition's Focus

Within this theme, New Energy Coalition focuses on the development of "best practices" for sustainable local energy systems, with attention to the three aforementioned challenges. With regard to the technical and economic (further) development of local energy systems, the focus is on the further development of intelligent energy systems, storage technology and the scaling up of test projects from TRL 6 (Technology Readiness Level) to market-ready applications, preferably in Living Labs. With regard to the social aspects of local energy systems, the focus is on further clarifying the relevant issues and then on the (co-)development of concepts in order to effectively address these issues.

Activities in 2018

Various projects in the field of Local Energy Systems were carried out in 2018. A key milestone was the award of "Lighthouse project Making City" to turn the municipality of Groningen into a European example of local energy systems. A similar project is being developed around Alkmaar, in order to make a start on permanent local, smart solutions there as well. Furthermore, New Energy Coalition is working on drawing up a research agenda relating to local energy systems. In addition, a study is underway into the preparation of research projects on Regional Energy Strategies and Heat Vision.

- **MAKING CITY** - a large-scale demonstration project focusing on the Positive Energy District (PED) approach, was awarded in 2018. See also: www.makingcity.eu
- **Smart City project Alkmaar** - Preparations for a similar Smart Grid/Smart City project in the city of Alkmaar.
- **SMILE (SMart ISland Energy)** - Developing new techniques for sustainable islands in Madeira (PT), Samsøe (DK) and Orkney (UK) towards market maturity, see also: <https://www.h2020smile.eu/>
- **ESTRAC (Energy Systems Transition Centre)** - launch of the "Transforming Regions" project, focused on cases in the built environment.



2.4 Industrial Transformation

What does New Energy Coalition want to achieve?

Industry is responsible for 40% of energy consumption, including energy as a raw material. The ambition of Dutch industry is to reduce CO₂ emissions by 49% in 2030 and to (almost) 0 by 2050. In order to achieve these goals, energy consumption must be reduced and made more sustainable. In the short term, the status quo of industrial processes will be maintained and maximum use will be made of existing industries and investments. In the longer term, new perspectives will be sought, such as increasing electrification and the (further) development of green raw materials, including sustainable CO₂.

New Energy Coalition's Focus

We are committed to finding sustainable alternative fuels for "high temperature" processes, by using hydrogen, for example (also described in the theme Hydrogen Economy) and other fuels such as green gas. Capture, storage and use of CO₂ (CCSU) also plays a major role in this theme. The possibility of a Chair in electrochemistry at RUG, supported by companies, is being investigated.

2.5 Green Gas

What does New Energy Coalition want to achieve?

Approximately three quarters of the energy in the current European energy mix is transported by molecules, the greening of which is the ultimate goal. It is estimated that in the Netherlands, 11 petajoules currently come from renewable gases (excluding hydrogen). The ambition for the next 10 years is to increase this to 70 petajoules (excluding hydrogen). Scaling up biogas and green gas production can contribute to this. LNG (bio-LNG) is also becoming increasingly mature as a technology. Typical applications are: raw materials for industry, high-temperature fuel, fuel for heavy transport and balancing of the energy system. Challenges include: biomass availability and prices, financing of projects and public project support.

Activities in 2018

The theme of Industrial Transformation is still under construction. In 2018, the first steps were taken to create a research agenda and preparations were made together with a broad consortium to develop an H2020 project concerning CO₂ use and storage.

- **Dutch Torrefaction Association** - support and development of a cluster that focuses on the further development of thermochemical technologies for the efficient application of biomass in energy and industry.
- **ESTRAC project Transforming Regions** - 'Transforming Regions' project, focused on industry cases

Activities in 2018

In 2018, various "greening the gas chain" projects were carried out, both in the field of Biogas/Green Gas, and BioLNG/LNG. Many parties are involved in these projects, which has further expanded the (knowledge) cluster. Several new (research) projects have also been launched.

- **GZI Emmen** - signing of a declaration of intent vis-à-vis a feasibility study into a hydrogen plant on the site of NAM's former gas purification plant (GZI) in the town of Emmen.
- **LNG Pilots** - accelerating the introduction of LNG as an alternative fuel in cross-border freight traffic: →

→ **New Energy Coalition's Focus**

Compared to the other themes, this theme is the most "mature". Projects are initiated and supported within this theme with the emphasis on increasing production and reducing costs. In order to meet the ambitions set out in the Cabinet's Climate Agreement, the annual green gas production capacity must increase to 70 petajoules in 10 years' time. This 70 petajoules is needed for the built environment, in addition, an as yet unquantified amount is needed to realise the ambitions of the industry and will also be drawn from mobility to biogas. In addition to biochemical conversion routes (fermentation), thermochemical routes (gasification) are increasingly playing a role within this theme. By making use of existing gas infrastructure that has become redundant, we expect to achieve an acceleration and a reduction in cost price. The same infrastructure may possibly also be used for CCUS projects.

Education and training activities

"Green Gas" has been integrated as a theme in several activities. In the second half of 2018, for example, two LNG courses were offered by EDI/NEC Business School. The first courses were also given in the context of the "Store&Go" project. Furthermore, EDI/Business School provided a green gas workshop in November as part of an outbound trade mission to Brazil.

strong growth of Dutch and German partners in 2018 (from 40 to 53); work is underway to expand the project to the North Sea countries - see also: <https://lngpilots.eu/>

- **CLINSH (Clean Inland Shipping)** - contributing to better air quality in urban areas – emission reducing technologies and alternative fuels tested in practice on 30 ships. In 2018, all ships were selected and the midterm conference was prepared - see also: <https://www.clinsh.eu/>
- **Barkmeyer LNG/gamechanger MS Ecodelta project:** construction of the innovative and ultramodern LNG-powered dredger named MS Ecodelta completed in 2018.
- **SNN ERDF subsidy development for new LNG ships:** A new application was submitted and granted in 2018.
- **BioPower2Gas:** nominated for the prestigious RAAK award 2018.
- **Completion of R&D programme** for a 1 MW gasifier at DNV-GL, options for relocation to the town of Delfzijl are being investigated.
- **Support for various projects for the digestibility of low-grade biomass:** two projects are operational, one is under development and one has been discontinued.
- **Applications for new knowledge/ company projects for pilots/demos submitted:** projects Stercore, Ambigo and Torrgas. Stercore expects to be granted the permit for the construction of a plant in the town of Emmen shortly.
- **Participation in an H2020 project** aimed at increasing the flexibility of digesters, by producing hydrogen for example. Application is pending.
- **Participation in an H2020 project** aimed at increasing the value of digestate (the residue after digestion). Application is pending.

3

Innovation and Education

3.1 General

In 2018, formal roles were fulfilled in the case of 59 projects - more than 40% as implementers and 22% as programme co-ordinators, roles as advisors were fulfilled in the other projects. Projects without a contract or decision were not included. 33 of the projects (55%) were restarted in 2018. The other projects started earlier. The focus was on R&D projects (83%) and a number of education projects (17%). Usually more themes converge per project. Green Gas, Local Energy and Hydrogen are the most represented themes. In total, the projects and (network) activities involve more than 200 unique collaborators, 60% of which from abroad, 15% national and 25% from the region. Of the parties, 40% were SMEs and 14% were large companies. The rest came from the government (21%), the knowledge sector (19%) or its other parties (6%).

Approximately two-thirds were subsidised projects, with a total value of over €35 million and a coalition share of 28% in 2018. Over the entire 2018-2020 measurement period, the projects amounted to almost €88 million, with a coalition share of almost €21 million (24%). In 2018, 8 new subsidy projects were started, with a total volume of almost €37 million and a coalition share of €9.6 million, of which €7.6 million was subsidy.

The total share of NEC and partners in the subsidy projects amounted to almost €9.9 million in 2018, of which €7.3 million was subsidy. 35% of grants came from EU programmes and 65% from national programmes. In addition to NEC, the knowledge partners in particular were well represented in the subsidy projects.

3.3 Business Development

What does New Energy Coalition want to achieve?

In addition to the themed activities (previously described under the themes), "Business development" also covers so-called cluster activities:

- Providing information about new developments and innovations in the field of energy, with a focus on the five themes mentioned above.
- Advising on the technological and economic feasibility of business cases and the possible subsidy and financing possibilities to support them;
- Organising meetings for the business community, knowledge institutions and governments to maintain, strengthen and further develop regional, national and international networks; and
- Initiating and stimulating new activities in the region by providing substantive knowledge and forming consortia for new project developments.

New Energy Coalition's Focus

The activities contribute to the strengthening of the economic structure in the Energy Valley Region by stimulating investment, developing innovation, strengthening co-operation between companies and institutions, expanding the economic infrastructure (such as business locations, incubators, test centres) and the acquisition of companies. Supporting individual SMEs and start-ups is also part of this task, as is promoting the North as an energy region.

Activities in 2018

Small and medium-sized enterprises (SMEs) are an important driver of innovation. In order to offer support, New Energy Coalition offers advice to SMEs in the provinces of Drenthe, Friesland and Groningen within the framework of the Northern Innovation Agenda of the SNN provinces (SNN NIA). This advice focuses on issues within the innovation themes. Support is demand-driven, requests for advice and effort spent on each project are recorded. In 2018, New Energy Coalition outperformed its defined targets in all areas of advising and supporting SMEs and start-ups via innovation contracts (branding, networking and proposition development). New Energy Coalition is currently engaged in discussions with the provinces about their partnership in this programme, including the continuation of activities currently covered by NIA.

- **Enterprise Europe Network (EEN)** - supports SMEs in international activities (mainly innovation), including: Future Tech of Mobility Business Event in the town of Assen, Windforce Bremen, Hydrogen & Fuel Cells event Birmingham.
- **Renewable energy trade mission Lithuania** - support and preparation for a royal visit by His Royal Highness King Willem Alexander of the Netherlands
- **Northern Connection (Interreg)** - promoting cross-border connections between SMEs and energy clusters, see also: <https://northsearegion.eu/northern-connections/> ←
- **Green Gas BBQ**, in co-operation with Groen Gas Nederland organisation
- **Collaboration with UNIDO (United Nations Industrial Development Organisation)** - resulting from previous co-productions, exploration of collaboration in UNIDO's Global Cleantech Innovation Programme (GCIP) in 2018, co-hosting events during the COP24 Climate Conference in Poland. →



- **Focus on Noord-Holland North region:** preparation for co-operation between Inholland Alkmaar/Inholland Academy and EDI/NEC Business School, arranging co-operation between IDEA and Energy VentureLab, the business accelerator programme of NEC/Groningen University/Hanze UAS and partners and various events.

3.4 Education and Human Capital

What does New Energy Coalition want to achieve?

New Energy Coalition contributes to supporting, facilitating and developing multidisciplinary and multi-level energy education in the North of the Netherlands: from vocational level up to MBA. Together with the knowledge institutes and other partners, NEC is committed to educating more students to become the experts, scientists and professionals of the future.

In 2018, for example, the English-language Energy minor was launched at the University of Groningen, with 28 students. What is unique is that the minor examines the energy transition explicitly from several disciplines. In this way, students gain insight into technical aspects, but also into policy and regulation, the economy and markets, social and behavioural aspects and international developments.

Activities in 2018

In 2018, NEC supervised various educational projects, organised learning activities (Energy Academy Programme) and, among other things, launched a large-scale recruitment campaign for students: "Choose Wisely, Follow Energy", see also: www.followenergy.nl



- **Energy Academy Programme of learning activities:** 32 events, 1,400 participants
- **Green Deal project "Human Capital"** - an overview of competences and skills and how the labour supply can meet this need.
- **Energy College project Gas 2.0:** the award of a major RIF subsidy of €2 million for training 3,400 professionals in the North of the Netherlands for the energy transition in the next 4 years, see also: www.energycollege.org



3.5 Energy Delta Institute/NEC Business School

Energy Delta Institute/NEC Business School focuses on providing training programmes for professionals. The portfolio consists of open market courses (short courses, master classes, executive programmes and a mini-MBA) and in-company courses. In 2018, 38 courses and training sessions were given, to a total of 684 participants.

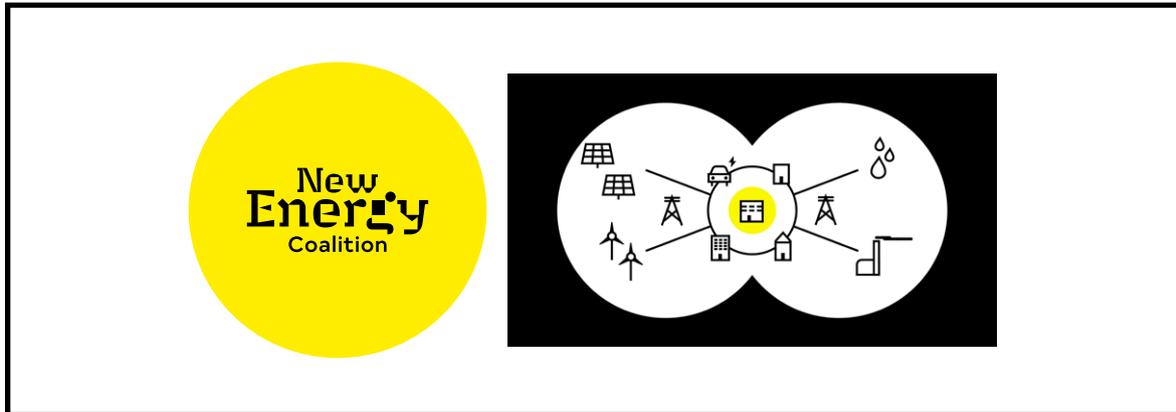
- Successful launch of the "Energy Transition for the Public Sector" training course, a 3-day training course for government professionals who have to deal with the energy transition on a daily basis.

4

Communication and Events

4.1 Communications & marketing

- Creation and launch of new house style/logo



- Production and launch of a corporate animation
- Preparation to develop a new website (launch 2019)
- Publications: a total of approximately 100 publications on New Energy Coalition in national media such as Volkskrant, NOS Journaal, FD and special interest media such as Energieia, Duurzaam Nieuws and De Groene Courant.

4.2 Events

A total of 53 events, 3,800 participants: organised jointly and independently, mainly in Groningen/region and a number of international events.

5

Organisation and Management

5.1 Organisation

In terms of organisation, since 2018 the New Energy Coalition organisation has consisted of a management team of 3 members and several teams:

- Research & Business Development (innovation)
- Education & Energy Delta Institute (EDI) Business School (education)
- Communication & Relationship Management
- Management (organisation/staff).

The organisation accounts to the Supervisory Board and consults the founders on the Foundation Board regarding its direction and choices. The Foundation Board consists of: The University of Groningen, Hanze University of Applied Sciences Groningen, Gasunie, GasTerra, NAM and EBN. In order to give the themes an integral form, we work as a matrix organisation. The multidisciplinary teams are responsible for the theme activities. We aim for a coherent portfolio of research, business development and education, aimed at both the long and short term (from basic to applied).

5.3 Internal financial organisation & staff

In 2018, New Energy Coalition had 18 strategic partners with working arrangements who were members of the Strategic Coalition Council and/or the International Supervisory Board. In total, these partners contributed 46% to the operation of NEC, by means of comparable contributions for projects and partner projects, the business school and/or a general (agency) contribution. The cover also comes from other projects and subsidy projects (34%) and services (20%), of which 80% from courses and 20% from secondment, conferences, studies, etc.

In 2018, the NEC organisation had an FTE of 46.2, 46% of which were female and 54% were male. The average age of the salaried employees was 39 years.