NECPs – Research, Innovation and Competitiveness

5th Energy and Climate Technical Working Group

08 October 2020
While benefiting from world-class research and strong industries…

- 7% of the world’s population
- 20% of global R&D
- 1/3 of all high-quality scientific publications

…Europe fails to transform leadership in science into leadership in innovation
Research, Innovation and Competitiveness: a key dimension through the evolving EU energy policy

- Energy Union
- Strategic Energy Technology Plan (SET Plan)
- Clean Planet for All
- European Green Deal

Identify the strategic research and innovation priorities and actions needed at EU level

The NECPs are intended to set out which of these objectives are being pursued nationally and how are being implemented
MS need to prepare and **take advantage** of the energy transition

NECPs should help identify and develop MS **competitive advantages**

Identify **competitiveness challenges**

- Develop **strategic value chains**
- **Cost-effective industrial transformation**
Research and Innovation is the missing link for better integrated plans

• The Governance calls for **integrated** NECPs
  - Horizontal integration: across the 5 dimensions
  - Vertical integration: link 2030 and 2050 time horizons

>>> The plan needs to be more than a reiteration of existing national strategies or plans
2.3.3. Research, innovation and competitiveness

There final NECPs fail to pay sufficient attention to R&I needs for delivering on climate and energy objectives. There is an overall decrease in national budgets devoted to R&I in clean energy technologies and a severe lack of national objectives and funding targets that show concrete and relevant pathways to 2030 and 2050. Most of the plans also outline only funding of existing non-energy specific programmes that run for fewer than five years.

A new strategic approach to clean energy R&I and competitiveness is needed to rebuild the European economy and accelerate the innovation and market uptake of new technologies and innovation for climate neutrality. Both EU and national R&I policies as well as funding and national industrial strategies need to be better aligned with energy and climate objectives and be made operational through NECPs.
2. NATIONAL OBJECTIVES AND TARGETS

2.5. Dimension research, innovation and competitiveness

i. National objectives and funding targets for public and, where available, private research and innovation relating to the Energy Union including, where appropriate, a timeframe for when the objectives are to be met.

ii. Where available, national 2050 objectives related to the promotion of clean energy technologies and, where appropriate, national objectives including long term targets (2050) for deployment of low-carbon technologies, including for decarbonising energy- and carbon-intensive industrial sectors and, where applicable, for related carbon transport and storage infrastructure

iii. Where applicable, national objectives with regard to competitiveness

3. POLICIES AND MEASURES

3.5. Dimension research, innovation and competitiveness

i. Policies and measures related to the elements set out in point 2.5

ii. Where applicable, cooperation with other Member States in this area, including, where appropriate, information on how the SET Plan objectives and policies are being translated to a national context

iii. Where applicable, financing measures in this area at national level, including Union support and the use of Union funds

4. ANALYTICAL BASIS

4.6. Dimension research, innovation and competitiveness

i. Current situation of the low-carbon-technologies sector and, to the extent possible, its position on the global market (that analysis is to be carried out at Union or global level)

ii. Current level of public and, where available, private research and innovation spending on low-carbon-technologies, current number of patents, and current number of researchers

iii. Breakdown of current price elements that make up the main three price components (energy, network, taxes/levies)

iv. Description of energy subsidies, including for fossil fuels

5. IMPACT ASSESSMENT OF PLANNED POLICIES AND MEASURES
ANNEX I

GENERAL FRAMEWORK FOR INTEGRATED NATIONAL ENERGY AND CLIMATE PLANS

Part 1

General framework

2.5. Dimension research, innovation and competitiveness

i. National objectives and funding targets for public and, where available, private research and innovation relating to the Energy Union, including, where appropriate, a timeframe for when the objectives are to be met.

ii. Where available, national 2050 objectives related to the promotion of clean energy technologies and, where appropriate, national objectives, including long-term targets (2050) for deployment of low-carbon technologies, including for decarbonising energy and carbon-intensive industrial sectors and, where applicable, for related carbon transport and storage infrastructure.

iii. Where applicable, national objectives with regard to competitiveness.
2.5. Dimension research, innovation and competitiveness

i. **National objectives** and **funding targets** for **public** and, where available, **private research** and innovation relating to the Energy Union, including, where appropriate, **a timeframe** for when the objectives are to be met

ii. Where available, **national 2050 objectives** related to the **promotion of clean energy technologies** and, where appropriate, national objectives, including long-term targets (2050) for deployment of low-carbon technologies, including for decarbonising energy and carbon-intensive industrial sectors and, where applicable, for related carbon transport and storage infrastructure

iii. Where applicable, **national objectives with regard to competitiveness**
Examples

2.5 Funding targets

2.5 Dimension Research, innovation and competitiveness

(i) National objectives and funding targets for public and, where available, private research and innovation relating to the Energy Union including, if appropriate, a timeframe for when the objectives are to be met.

As a participant in the international cooperation "Mission Innovation" Denmark has committed to double its public funding to research and development to 580 mio. DKK in 2020. The Danish parliament has recently reached a new energy agreement with the target of spending 1 billion DKK on energy research and development by 2024.

Denmark does not have any funding targets for private research and innovation relating to the energy union.

which means an annual spending of 285m Euros. Considering the abovementioned, as well as the investments that have to be done up to 2030 to reach national targets, annual spending in research and innovation related energy and climate, for 2020 – 2030, has to be raised to 15m Euros, while currently it doesn’t exceed 5m Euros.

X 2
Denmark
(Also Italy)

X 3
Cyprus
2.5 ii Objectives

Poland

- increase in the number of patent applications in energy sector entities and research institutes by 200% as compared with 2018;

Croatia

- switching as many activities as possible to the use of electricity (where technologically feasible and long-term cost-effective);
Section 2.5 - National objectives and funding targets

- Don’t confuse funding targets with national objectives. The funding targets **should serve** to fill the national objectives.
- When giving the RIC spending, it cannot be for all R&D, it MUST be **energy specific**.
- Moreover, it must be **year specific** (a timeline). Otherwise comparisons are not direct.
- Objectives should be **SMART** (specific, measurable, achievable, relevant, time-bound).
- Some plans do no go beyond a specific year (e.g. 2022).
Section 2.5 - National objectives and funding targets

- If a national strategy/plan/roadmap is mentioned, its key priorities and related funding, if any, should be elaborated.

- Most of the times the agreed SET Plan objectives are not reflected as national objectives.

- The section should include the 2050 objectives and targets, if available. If not, possible scenarios/pathways identified may be indicated.
Take away messages:
1. Energy specific
2. Year specific

Don’t conflate funding targets with national objects.

Avoid wording inconsistency (Use the adopted regulation only)
### 3. POLICIES AND MEASURES

#### 3.5. Dimension research, innovation and competitiveness

1. Policies and measures related to the elements set out in point 2.5

2. Where applicable, cooperation with other Member States in this area, including, where appropriate, information on how the SET Plan objectives and policies are being translated to a national context

3. Where applicable, financing measures in this area at national level, including Union support and the use of Union funds
3. POLICIES AND MEASURES

3.5. Dimension research, innovation and competitiveness

i. Policies and measures related to the elements set out in point 2.5

Examples

AU: Pursuant to the new regulations, the NRP will apply until the Cabinet adopts (no later than by 31 March 2020) a new state science policy as part of which the priorities and strategic research programmes will be updated.

The updated strategic research directions in the field of energy and climate should be consistent with the Strategy for Responsible Development (SRD) and in the field of low-carbon technologies, additionally with the new Energy Policy for Poland 2040.
**CZ:** RDI priorities are valid for the period until 2030 with gradual progress. Within the defined 6 priority areas, there are 24 sub-areas with a total of 170 specific targets.

<table>
<thead>
<tr>
<th>Area:</th>
<th>Sub-area:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renewable energy sources</td>
<td>Developing economically efficient solar energy</td>
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<tr>
<td></td>
<td>Developing economically efficient use of geothermal energy</td>
</tr>
<tr>
<td></td>
<td>Developing economically efficient use of biomass</td>
</tr>
<tr>
<td>Nuclear sources</td>
<td>Efficient long-term use of existing nuclear power plants</td>
</tr>
<tr>
<td></td>
<td>Supporting the safety of nuclear installations</td>
</tr>
<tr>
<td></td>
<td>Research to support the construction and operation of new economically efficient and secure units</td>
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<tr>
<td></td>
<td>Research and development of the fuel cycle</td>
</tr>
<tr>
<td></td>
<td>Storage of radioactive waste and spent fuel</td>
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<tr>
<td></td>
<td>Research and development of 4th generation reactors, especially efficient and safe fast reactors</td>
</tr>
<tr>
<td>Fossil energy sources</td>
<td>Economically efficient and environmentally-friendly fossil power and heating</td>
</tr>
<tr>
<td>Electric networks including energy storage</td>
<td>Capacity, reliability and safety of backbone transmission networks</td>
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<tr>
<td></td>
<td>Modifying networks for ‘demand-side management’</td>
</tr>
<tr>
<td></td>
<td>Electricity storage, including the use of hydropower</td>
</tr>
<tr>
<td></td>
<td>Security and resilience of distribution networks</td>
</tr>
<tr>
<td>Numbering</td>
<td>Name of policy measure</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------------------------</td>
</tr>
<tr>
<td>M1.1</td>
<td>Development of innovative energy-saving technologies</td>
</tr>
<tr>
<td>M1.2</td>
<td>Development of innovative decarbonisation technologies</td>
</tr>
<tr>
<td>M1.3</td>
<td>Digitisation of energy networks - smart networks</td>
</tr>
<tr>
<td>M1.4</td>
<td>Promotion of innovative technologies in transport</td>
</tr>
<tr>
<td>M1.5</td>
<td>Development of innovative energy storage applications</td>
</tr>
<tr>
<td>M1.6</td>
<td>Implementation of horizontal measures for improving the conditions for conducting research</td>
</tr>
<tr>
<td>M1.7</td>
<td>Promotion of entrepreneurship through research and innovation actions which are embedded in the market functions</td>
</tr>
</tbody>
</table>
A series of policies and measures have been put in place to achieve the objectives. The most significant consist of the following Funds:

- Electric System research fund
- Fund for actions and measures for technological and industrial developments
- Fund for the development of intangible capital
- Guarantee Fund
- Hyper-amortisation and super-amortisation
- Capital goods (‘New Sabatini Law’)
- ...
**LV:** Measures laid down in GDSTI2020 for reaching R&D, innovation, and competitiveness objectives influencing the period covered by the Plan to be implemented indicatively in the period after 2020:

- Increasing competitiveness of the STI field (competent authority: MoES)
- Linking the STI industry with the needs of social and economic development (competent authorities: MoES, MoE)
- Continue to develop competence centres as a long-term platform for cooperation between scientific institutions and economic operators;
- ...

+ clear outcomes and funding allocated per each measure!
### 3. POLICIES AND MEASURES

#### 3.5. Dimension research, innovation and competitiveness

- **Policies and measures** related to the elements set out in point 2.5

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**Weak points for improvement:**

- Policies and measures are not always linked to the objectives mentioned in section 2.5
- They can be vaguely expressed, lacking elaboration and information
- They can be under preparation
- They include only policies, but not measures and allocation of funding
- Policies related to the period up to 2020 should not constitute the core section. Forward looking or updated policies should be developed
- Plans include some measures, but not for 2030 (for ex. until 2020 or 2022).
- There is no clear timeline
3. POLICIES AND MEASURES

3.5. Dimension research, innovation and competitiveness

ii. Where applicable, cooperation with other Member States in this area, including, where appropriate, information on how the SET Plan objectives and policies are being translated to a national context

Examples

**AU:** is actively involved in selected SET Plan key actions currently focused on:
- new technologies and services for consumers
- resilience and security of the energy system
- new materials and technologies for buildings
- energy efficiency for industry

Together with the Chamber of Commerce, a governance structure was set up in Austria for the purposes of participating in Mission Innovation. With the agreement of Austrian stakeholders, participation in Mission Innovation will initially focus on Smart Grids (ICI), Heating and Cooling of Buildings (IC7) and Hydrogen (IC8).
DK: As a participant in the international cooperation “Mission Innovation”, Denmark has committed to double its public funding to research and development to 580 mio. dkr. in 2020. The funding will be earmarked energy research and development on the annual state budget.

Denmark is an active member of Nordic Energy Research. According to its strategy for the period 2018-2021 the vision of NER is to create the knowledge basis for the Nordic countries to become global leaders in smart energy. The mission is progressed through Nordic collaboration.
3. POLICIES AND MEASURES

3.5. Dimension research, innovation and competitiveness

ii. Where applicable, cooperation with other Member States in this area, including, where appropriate, information on how the SET Plan objectives and policies are being translated to a national context.

Weak points for improvement

- Mention only one international partnership, but without further elaboration
- No mention, even if the Member State is part of it and of specific Implementation Plans (IPs)
- Mention of consultation platform/forum on SET Plan but no elaboration
- Only mention of the framework, without elaborating on it and explaining how this is translated in national policies
- Sometimes collaborations are described, but without setting out how they contribute to achieve the national policies
- No specific reference to all the IPs to which the Member State is part of and has agreed on specific targets and actions
- IPs actions and targets well described, but no link between the national objectives
- No clear financing allocation for related SET Plan actions
3. POLICIES AND MEASURES

3.5. Dimension research, innovation and competitiveness

iii. Where applicable, financing measures in this area at national level, including Union support and the use of Union funds

Examples

IE: The Department of Business, Enterprise and Innovation is spearheading the Government’s new €500 million Disruptive Technologies Innovation Fund.

This is one of four funds under the National Development Plan 2018-2027.

Applications under this fund must align with the aforementioned research priority areas, which include the Energy, Climate Action and Sustainability theme, and “Decarbonising the Energy System” research priority area.
**SK:** Estimated financial provision for the implementation of the outlook plan.

The indicative budget for the ENERGETIKA SRDP is 84,093 mil. EUR for 2024-2028.

The proposed budget below takes into account projected GDP growth and includes all three SRDP sub-programmes.

<table>
<thead>
<tr>
<th>Year</th>
<th>2024</th>
<th>2025</th>
<th>2026</th>
<th>2027</th>
<th>2028</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Budget</td>
<td>16.819</td>
<td>17.155</td>
<td>17.498</td>
<td>17.848</td>
<td>18.205</td>
<td>87.525</td>
</tr>
</tbody>
</table>
3. POLICIES AND MEASURES

3.5. Dimension research, innovation and competitiveness

ii. Where applicable, cooperation with other Member States in this area, including, where appropriate, information on how the SET Plan objectives and policies are being translated to a national context.

Weak points for improvement:

- Reference to national funds, but **no detail of the budget**
- They can be **under preparation**
- Financing measures **up to 2020** should not constitute the core section. Forward looking financing measures should be foreseen
- When presenting the EU funds, it is not necessary to fully describe them, but rather to **focus on the national use of them**
- Reference only to **one funding instrument** (i.e. Smart Specialisation Strategy)
- **Description** of budgetary management at national level, which may be **too detailed**
The RIC analytical basis (4.6) in the Governance Regulation

Annex I – Section B.4.6 Current and projections with existing policies and measures (RIC)

i. Current situation of the low-carbon-technologies sector and, to the extent possible, its position on the global market

ii. Current level of public and, where available, private research and innovation spending on low-carbon-technologies, current number of patents, and current number of researchers

iii. Breakdown of current price elements that make up the main three price components (energy, network, taxes/levies)

iv. Description of energy subsidies, including for fossil fuels
A quantitative description of current situation of the different LCTs is often missing.

Few Member States reported R&D investments specifically for LCTs.

There is limited information on numbers of patents and researchers.

Coverage of topics by Member State:
1. Situation of the low-carbon tech sector (22)
2. Public & private R&D investments in LCTs (8)
3. Patents (15)
4. Researchers (3)
Key recommendations

- Provide **quantitative** information, also for the situation of individual low-carbon technologies and their position in global markets.
- For R&D spending, focus on the **low-carbon technology sector**.
- Make **links with the analytical basis of other dimensions** of the Energy Union and the **model-based analysis**.

Consider using 4.6 as a possible **benchmark for setting the level of ambition**, i.e. competitiveness objectives (2.5).
Suggestions and potential sources of data

<table>
<thead>
<tr>
<th>WHAT</th>
<th>WHERE (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Size of domestic clean energy market / domestic production, imports &amp; exports</td>
<td>ESTAT COMEXT, UN COMTRADE National stakeholders: Industrial associations, Chamber of Commerce, ...</td>
</tr>
<tr>
<td>• Number and annual turnover of new companies active in the sector</td>
<td></td>
</tr>
</tbody>
</table>

Public R&I investments on LCT | IEA, JRC/SETIS |
Private R&I investments on LCT | National surveys, JRC/SETIS |
Patents on LCT                  | National Patent Offices, EPO/PATSTAT, JRC/SETIS |
Researchers in LCTs             | e.g., EERA, EUA |

(*) Forthcoming JRC Note
4.6. Dimension research, innovation and competitiveness

i. Current situation of the low-carbon-technologies sector and, to the extent possible, its position on the global market (that analysis is to be carried out at Union or global level)

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**Weak points for improvement:**

- **Limited description** of the state of play of the different technologies;
- Quantitative indicators are missing;
- Level of ambition unclear as **benchmarks** are missing;
- Most of the times, lack of number of **patents**;
- Lack of info on **subsidies**.
• Member States acknowledge the importance of R&I and the interlinkages between R&I and the other dimensions.

• But only rarely set specific targets nor policies and measures.

• There are some good examples.
28 MS received recommendations to the draft plans related to research and innovation

- MS to make **additional efforts to integrate research and innovation** into their NECPs
- Links with priorities identified in the **Strategic Energy Technology Plan (SET Plan)** should be better explored
- The Commission’s Long Term Strategy (LTS) highlights the **need for a massive coordinated effort**
Draft NECP observations

- There are many good examples
- NECPs are heterogeneous
- NECPs are often ambiguous on normative versus descriptive
- Not enough funding in MS; RIC budgets are very reliant on EU support for many MS
- The European Commission is ready to react fast with funding
- Use the updated “non-paper” for guidance
Thank you for your time

Alessia Clocchiatti

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