Challenges & risks
of digitalization in the energy sector
8th Workshop of Eastern Partnership Energy Regulatory Bodies Workshop

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Disclaimer

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Minsk, 21 May 2019
What do we understand by „digitalisation“?

Before we start . . .

- digital transformation
- digital, i.e. non-analog, representation
- digital control
- optimisation
- AI
- automation
- RPA
- VR
- disrupton
- innovation
- scalability
- flexibility
- computerisation
- individualisation
- flexibility
- BigData
- insurtech
- prtech
- govetech
- enertech
- regtech
- autonomization
- digitalisation
- fintech
- insurtech
- churchtech
- block chain / DLT
- machine learning
- suptech
- legaltech
- enviro tech
- RPA
- AI
- blockchain / DLT
- surtech
- enertech
- scalabilty
- VR
How does digitalisation affect a regulator?

Digitalisation challenges regulatory authorities in all its roles

- Fulfil tasks and obligations as "company" (monitoring, report, etc. tasks);
- Efficiently reaching company goals requires more and more the use of new technologies (e.g., for data collection and processing);
- E-government, E-regulation, etc.

- Setup rules within legally defined boundaries (market and technical rules);
- Identify & understand innovative developments:
  - regulator must serve as informed sparring partner for the market;
  - regulator prepares future-oriented framework conditions.
Where do digitalisation & energy markets meet?

Evolution & innovation along the whole energy value chain – amended by a new “digital dimension”

<table>
<thead>
<tr>
<th>Production</th>
<th>Transport</th>
<th>Trading</th>
<th>Sales</th>
<th>Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financing of infrastructure (tokenization, sharing)</td>
<td>Asset-monitoring and ownership (M&amp;A, registration, data evaluation)</td>
<td>Optimization of operations (predictive maintenance)</td>
<td>Transparency for market participants &amp; regulators</td>
<td>Smart meter(ing)</td>
</tr>
<tr>
<td>Temporary access to customer data</td>
<td>&gt; Transparency for market participants &amp; regulators</td>
<td>&gt; Automation/autonomisation</td>
<td>&gt; Switching process</td>
<td>&gt; Metering and settlement of charges &amp; levies</td>
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<tr>
<td>&gt; Simplification of data exchange &amp; matching between market roles (e.g., congestion management)</td>
<td>&gt; P2P trading</td>
<td>&gt; Technical realisation of “energy communities”</td>
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<td>&gt; Energy management systems</td>
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<tr>
<td>&gt; Processing of PPA</td>
<td>&gt; Backoffice (post trade)</td>
<td>&gt; Energy management systems</td>
<td>&gt; Temporary access to customer data</td>
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</tr>
</tbody>
</table>

Digital value chain

<table>
<thead>
<tr>
<th>INFRASTRUCTURE &amp; SENSORS</th>
<th>PROCESSES &amp; COMMUNICATION</th>
<th>DATA &amp; ANALYTICS</th>
<th>DIGITAL SERVICES &amp; CUSTOMER VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Wind park design</td>
<td>&gt; Decentralized smart grids</td>
<td>&gt; Market surveillance / monitoring</td>
<td>&gt; Guarantees of origin</td>
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<tr>
<td>&gt; Improved gas/oil prod. (machine learning)</td>
<td>&gt; Flex markets</td>
<td>&gt; Insider information</td>
<td>&gt; Regionality certifications</td>
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<tr>
<td>&gt; Digital Twins</td>
<td>&gt; Dynamic pricing (incl. DSR vouchers)</td>
<td>&gt; Price transparency</td>
<td></td>
</tr>
<tr>
<td>&gt; Digital Twins</td>
<td>&gt; Implementation of local markets</td>
<td>&gt; Pay-as-you-go models</td>
<td></td>
</tr>
</tbody>
</table>

Energy sector value chain
Challenges for digitalisation in the energy sector... arise from the primarily digital aspects thereof.

- New data monopolies?
- Cost/benefits
- Data protection?
- Governance?
- Cyber security
- Regulation of automated / autonomous processes?
- Data vs. information?
Challenges for digitalisation in the energy sector... arise from “traditional” and technology-agnostic issues!

Energy sector value chain

- New data monopolies?
- Cost/benefits
- Data protection?
- Data vs. information?
- Governance?
- Cyber security
- Regulation of automated / autonomous processes?
- Physical vs. virtual?
- "Smart vs. iron"
- Design of P2P networks?
- Network tariffs
- Affordability for end consumers
- Design of e.g. flex markets? (competition)
- Roles?
- Financing of smart infrastructure

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Challenges for regulators and policy makers

...key issues to be addressed in the future!

**EFFICIENT INNOVATION MANAGEMENT**
- Identification of relevant tech
- Sufficient knowledge depth
- Dynamic and well-trained HR

**SPEED UP REGULATORY DECISIONS**
- Decision processes in an increasingly dynamic setting required
- Danger of late reaction

**FUTURE-ORIENTED DECISIONS AND FRAMEWORKS**
- Abide by regulatory principles
- Technology neutral
- Business model neutral

**OBSTRUCTIONS FOR ISSUE OR TECHNOLOGY?**
- What is obstructed? The tech or the underlying market/system design?

**DEVELOP SOLUTIONS TO FUNDAMENTAL ISSUES**
- Generation, storage of and access to data
- Governance

**INTERDEPENDENCIES WITH OTHER SECTORS**
- Finance
- Transport & mobility
- Internal data market

**A FIRST STEP**
- "CEER public consultation on Digitalisation in the Energy Sector"

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