Global Tracking Framework for Sustainable Energy & Pathways to Sustainable Energy Project

4th Session of the Group of Experts on Energy Efficiency

1 November 2017, Geneva
Tracking Progress in Sustainable Energy
“Where are we standing today?”
- Global Tracking Framework: UNECE Progress in Sustainable Energy

Pathways to Sustainable Energy
“How do we achieve sustainable energy?”
- UNECE Project Introduction
Progress fell short of what is needed to meet 2030 targets

- Electricity Access: Target: **100%**, 2014: **85.3%**
- Access to Clean Cooking Fuels & Techn.: Target: **100%**, 2014: **57.4%**
- Share Renewables in TFC: Target: **36%**, 2014: **18%**
- Energy Efficiency: Target: **-2.6% CAGR**, 2012-2014: **-2.1%** (compare CAGR 2010-2012: **-1.9%**)

For all targets: Rate of change insufficient
- EE closest to meet 2030 targets

CAGR = Compound annual growth rate
Energy Efficiency and Renewable Energy progress insufficient

- **Access to Electricity**
  - Objective: 100%
  - 91.0%

- **Access to Clean Fuels & Technologies for Cooking**
  - Objective: 100%
  - 72.0%

- **Energy Efficiency**
  - Objective: -2.6%
  - -2.0%

- **Renewable Energy**
  - Objective: 36%
  - 11.5%

- **Access to electricity, 2014, UNECE Region**
- **Access to electricity, 2030 — IEA estimates, globally**
- **2030 Target: Ensure 100% access to electricity**
- **Access to clean cooking, 2014, UNECE Region**
- **Access to clean cooking, 2030 — IEA estimates, globally**
- **2030 Target: Ensure 100% access to clean cooking**
- **Compound annual growth rate of primary energy intensity, 2012–14, UNECE Region**
- **Compound annual growth rate of primary energy intensity, 2012–30 — current trends, globally**
- **2030 Target: Double the global rate of improvement in energy efficiency, expressed as compound annual growth rate (CAGR) of primary energy intensity**
- **Renewable energy share, 2014, UNECE Region**
- **Renewable energy share, 2030 — IEA estimates, globally**
- **2030 Target: Double the share of renewable energy in the global energy mix**
Decline from 8MJ/USD in 1990 to 5.1MJ/USD in 2014 (2011ppp)

- North America
- Western and Central Europe
- Southeast Europe
- Eastern Europe, Caucasus, Central Asia, Turkey and the Russian Federation
Energy Efficiency
Demand and Supply Side Perspectives

SE4ALL Indicators: 8MJ/USD in 1990 to 5.1MJ/USD in 2014 (2011 ppp)
3.9EJ avoided TFC between 2012 -2014

Supply Side Energy Efficiency
- Fossil fuel power plant efficiency grew from 36% in 1990 to 41% in 2014
- Gas fired generators improved from 37% in 1990 to 49% in 2014, the highest amongst regions
- Electricity T&D losses declined from 8.2% in 1990 to 7.2% in 2014, the lowest amongst the regions
- Natural gas T&D fell from 1.2% to 0.6%

Demand Side Energy Efficiency
- Most countries have National Energy Efficiency Action Plans, but limited progress and compliance tracking
- Building energy efficiency is slow
- Solid appliance efficiency progress in North America and the EU
- Largely untapped industry energy management productivity potential
- Outside EU, vehicle fuel economy not progressing

Significant scope to replace coal with gas and renewable energy power options

Further value in studying energy efficiency progress, potentials and prospects.
Project Overview
Pathways to Sustainable Energy

- **Timeframe:** May 2017 – June 2019 (Phase I)
- **Overarching Question**
  
  *How can the UNECE Region attain Sustainable Energy?*

- **Key deliverables**
  - Development of policy and technology options / technology portfolio
  - Modelling of Sustainable Energy scenarios
  - Definition of adaptive policy pathways
  - Definition of Key Performance Indicators
  - Conceptualization of an early-warning system
  - 2-4 workshops to define & discuss policy options
  - High-level policy dialogue planned for 2019

https://www.unece.org/energy/pathwaystose.html
Global Modelling
UNECE modelling
Regional subsets
  - North America
  - Western Europe
  - Central and Eastern Europe
  - Southeast Europe
  - Caucasus
  - Central Asia
  - Ukraine, Belarus, Moldova
  - Russian Federation
  - Turkey
  - Israel

See countries in each cluster here: http://data.ene.iiasa.ac.at/message-globiom/message_globiom/overview/spatial.html
Focal question: How can countries attain sustainable energy by 2050?

I  What is the optimal energy-mix for different sub-regions within the UNECE region in order to help achieve the 2030 Agenda and create a sustainable energy system?

- Energy mix
- Role of sub-regional energy trade / Regional cooperation
- Geopolitical consequences by increased RE upscaling / SE transition (tbd)
- Country leadership

II  What can be drivers for the transition towards a sustainable energy system?

- Policies
- Technologies
- Infrastructure
- Finance / Investments

III  How to track progress towards achieving and for maintaining a sustainable energy system?

- Key performance indicators for continuous improvement & feedback-loop
- „Early warning“ system

*Case Study: Further analysis of an existing national, sub-regional, sectoral case; Deep Dive: Further analysis of modeling results as part of a research question.
Target Definition: Sustainable Energy

Three pillars

Energy Security
- Energy Intensity (Final, primary)
- Share of RE
- Resilience
- Robustness
- Reliability
- Energy imports vs. Exports
- Investment requirements

Sustainable Energy
- Carbon intensity of GDP & of energy
- Air pollution
- Land use
- Water use
- Waste produced

Energy for Quality of Life
- Energy affordability / prices
- Physical energy
- Access
- Energy Services

Environmental Protection
- Energy Services
Technology Portfolio
• Nuclear energy, hard/soft coal, natural gas, oil, biomass, wind, solar, CCS/CDR, energy efficiency technologies in final energy uses etc.

Technology Zoom-In
• Energy Storage
• Power2X,
• CCS / CDR technologies
• Energy Efficiency
Committee on Sustainable Energy
Flagship project: Pathways to Sustainable Energy

- Overseen by the Committee
- Potential to link expert groups’ work, making use of synergies
- The project’s results can serve the group, and vice versa

### Committee on Sustainable Energy

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<thead>
<tr>
<th>Group of Experts on Gas</th>
<th>Group of Experts on Coal Mine Methane</th>
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<tbody>
<tr>
<td>Experts Group on Resource Classification</td>
<td>Group of Experts on Renewable Energy</td>
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<tr>
<td>Group of Experts on Cleaner Electricity Production from Fossil Fuels</td>
<td>Group of Experts on Energy Efficiency</td>
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Project Timeline

Engagement with the Expert Community

Status update 26th CSE
Geneva, Sep 2017

Expert Workshop
U.S., Q2 2018 (tbc)

Expert Workshop
Western-Central
Europe, Q1 2018 (tbc)

Expert Workshop
Central Asia, Q2/3 2018 (tbc)

Preparatory Meeting
Geneva, Q1 2019 (tbc)

Policy Dialogue &
Workshop at 27 CSE
Geneva, Sep 2018

High-level Political Dialogue
Q2 (2019)

Kick-off & Expert Workshop at 8th IFESD
Astana, Jun 2017

Modeller Kick-off Workshop
Oberhausen, May 2017

Expert Workshop
at 9th IFESD
Ukraine, Q4 2018

CSE = Committee on Sustainable Energy
Discussion

Expert Group’s Involvement in the Project

- Reaction to the presented slides
- How to strengthen the expert groups involvement in the Project?
  - ... in the development of policy options
  - ... in the discussion and formulation of scenarios (workshops)
  - ... in the development of policy pathways
- How to formalize the interventions:
  - Work plan – Areas: Regulatory and policy dialogue addressing barriers to improve energy efficiency (finance); sharing experiences and best practices to improve energy efficiency in the industry sector
  - Focal point?
  - Involvement in policy or technology group?
  - Planning for 27th session of the Committee: Sep 2018
For more information please visit the Project website: https://www.uneca.org/energy/pathwaystose.html

Thank you!

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