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UNECE support mechanisms to increase the uptake of renewable energy

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IRENA Central Asia Regional Workshop – Long-term Capacity Expansion Planning with a High Share of Renewables. Astana, 14-15 March 2019

Global Energy Status Quo

Fossil fuel v. Renewable Energy

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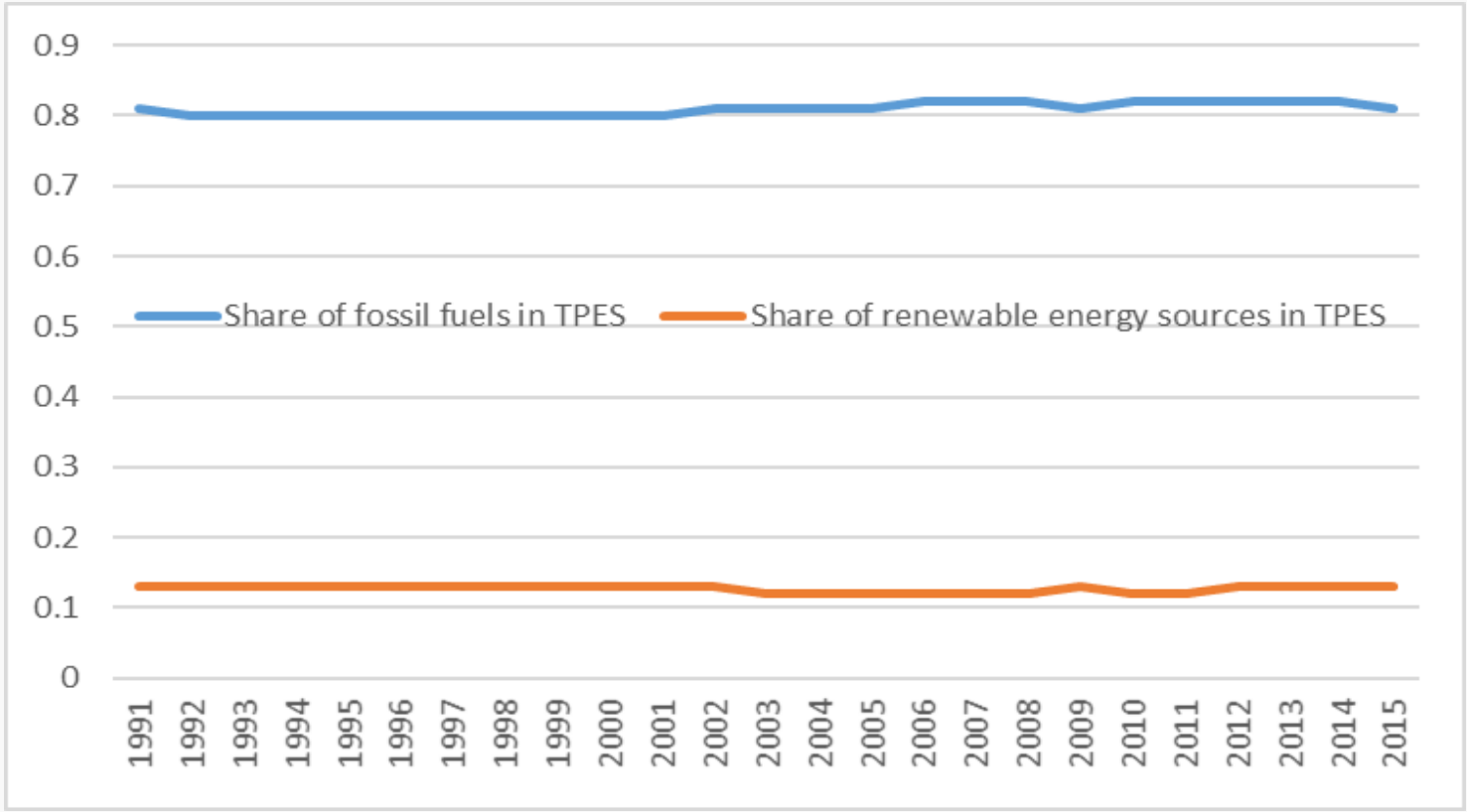
The World's Total Primary Energy Supply (1991-2015)



Source: IEA (2016)

Renewable Non-renewable Energy Capacity Additions

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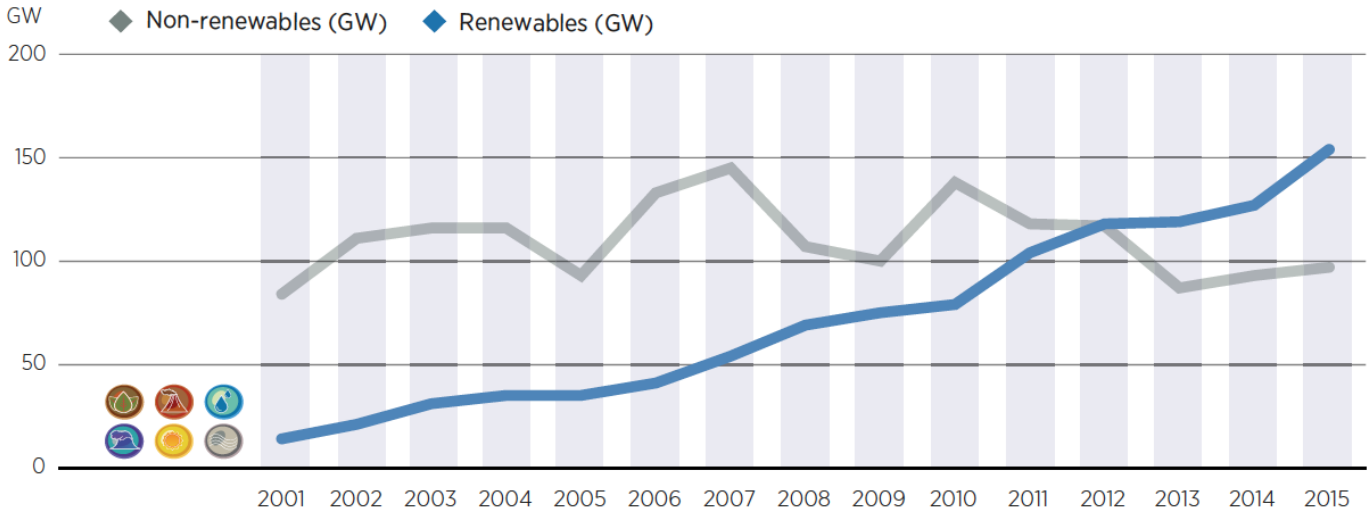
Figure 1.3 Renewable and non-renewable power capacity additions, 2001-2015



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Renewables (GW)	14	21	31	35	35	41	54	69	75	79	104	118	119	127	154
Non-renewables (GW)	84	111	116	116	93	133	145	107	100	138	118	117	87	93	97

Source: IRENA, 2016b

1 Excludes 154 GW of pure and mixed pumped storage capacity otherwise included in hydropower capacity. The bulk of this 154 GW is pure pumped storage capacity that contains no renewable energy generation component but is instead a storage medium for grid power of any origin.

2 Including solar power and heat, wind power, hydropower, ocean energy, geothermal power and heat, and modern bioenergy.

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Renewable Energy Investment Overview 2004-2014

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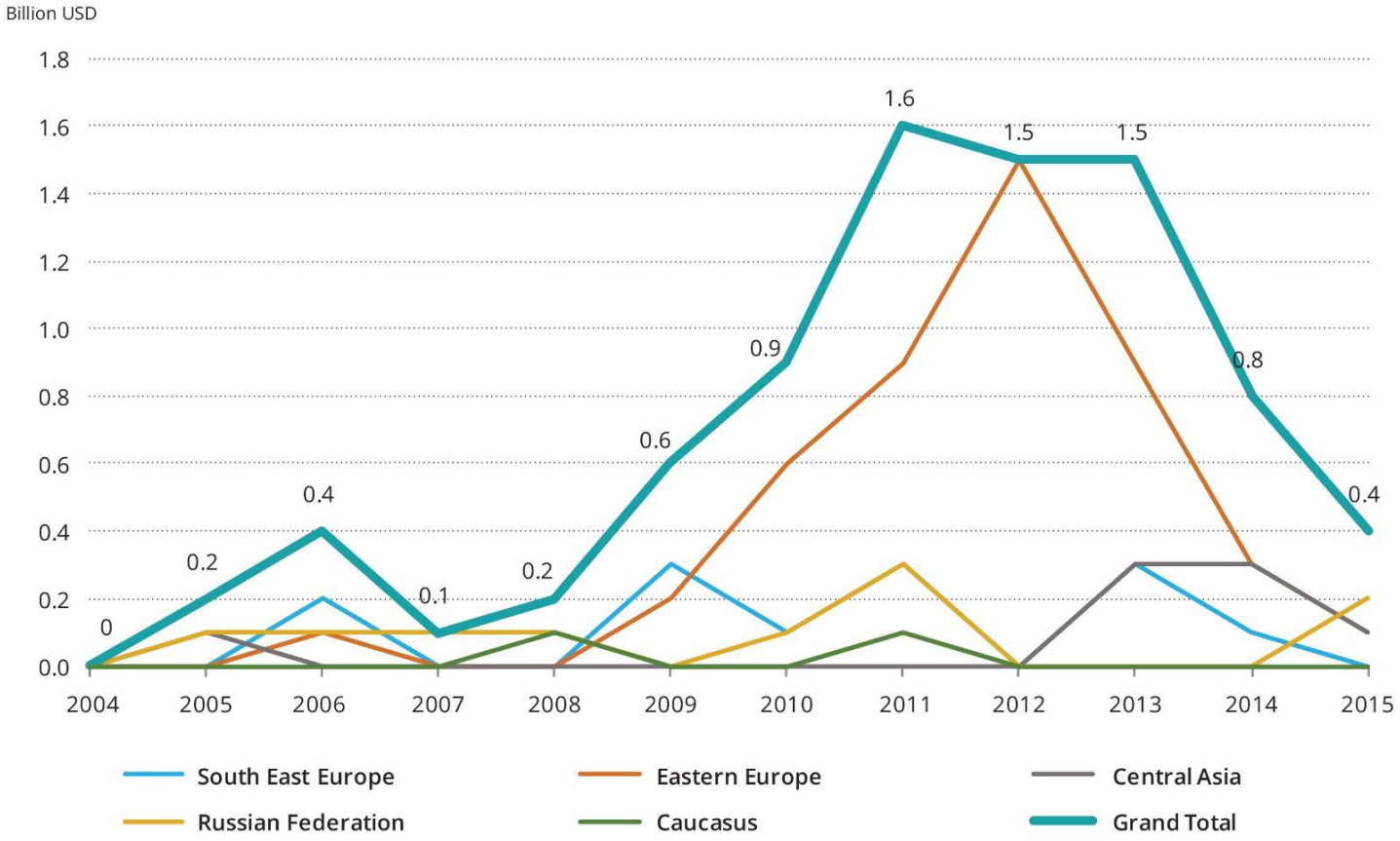

UNECE Group of Experts on Renewable Energy (GERE)

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The GERE started in 2014 as a subsidiary body to the Committee on Sustainable Energy and aims to:

- Determine the status of RE development and tracking its progress in the UNECE region
- Facilitate policy dialogue, exchange of best practices and data
- Consider the role of renewable energy within the context of future energy systems
- Promote instruments for assessing renewable energy resources and support possible synergies between renewable energy and fossil fuels in the energy production
- Identify needs, key bottlenecks and opportunities for potential investment

GERE Key Outputs

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- REN21 UNECE Renewable Energy Status Report (2015 & 2017)
- Investment Matchmaking events in Baku (2016) and Astana (2017) at the 7th and 8th International Forum on Energy for Sustainable Development.
- Hard Talks events: Georgia (2016), Ukraine (2016), Azerbaijan (2017), Kazakhstan (2018), Bosnia and Herzegovina (2018)
- Planned Hard Talks 2019:
  - Serbia (21-22 March 2019)
  - Russian Federation (Mid June 2019)
- 5th session of the GERE, Geneva, 10-11 October 2018

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GERE RE Hard Talks

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Hard Talks: An Innovative Policy Dialogue Tool For Unblocking Renewable Energy Barriers to Investment

- A uniquely formatted **multi-stakeholder** dialogue:
  - Involved Ministries – Energy, Economy, Finance, etc.
  - Other key players – RES Agencies, Regulators, Network operators
  - Private sector –project developers, industry associations
  - Parliament, NGOs, media (2nd day)
  - Financial actors – IFIs, development banks and commercial lenders
  - International community – Donors, Consulates, etc.
- Adapted to the specifications and requirements of the host country
- Discussion guided by a **practical "problem/solution" Discussion Paper**
- **Neutral international facilitators** for the dialogue
- Involves two days – **one expert day** following by a **half day for high-level decision-makers** to deliver key messages from experts
- **Conclusion**: Discussion Paper is reformatted into a **"Recommendation Paper" prioritizing the next steps** which is sent to all participants and high-level decision-makers for further action

Pathways to Sustainable Energy Project
Definition of Sustainable Energy

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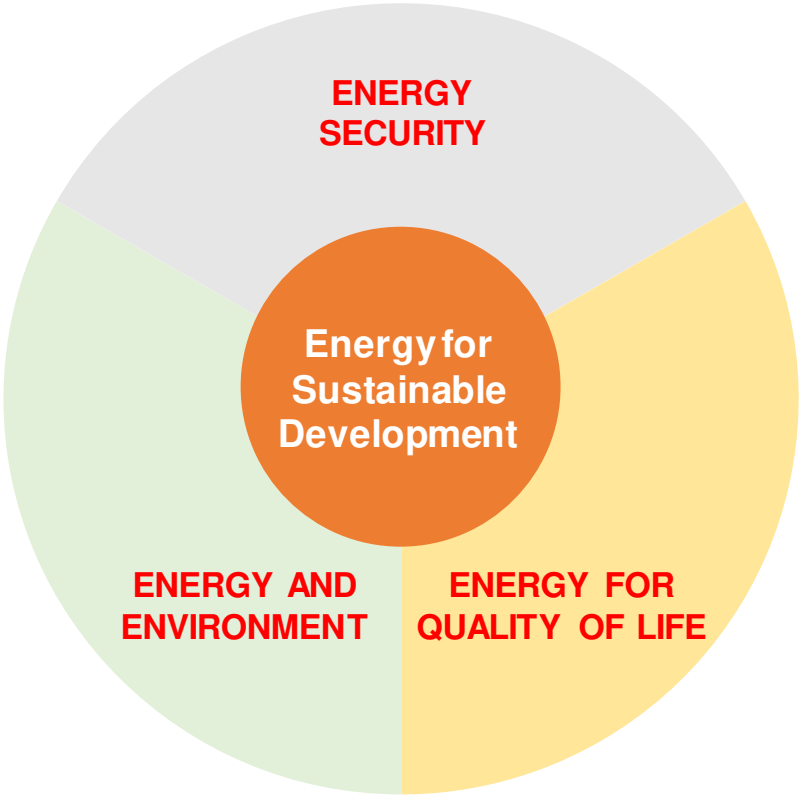
"Secure the energy needed for economic development"

- Energy Demand
- Electricity generating capacity
- Primary energy and final energy Mix (at subregional level)
- Energy Intensity (at subregional level)
- Net energy trade



"Minimize adverse energy system impacts on climate, ecosystems & human health"

- GHG emissions
- CO2 emissions per sector
- Water consumption in energy sector
- Mineral resource extraction

"Provide affordable energy that is available for all at all times"

- Energy Access: electricity generation by technology
- Energy Affordability: electricity consumption per capita
- Energy expenditure as a share of GDP
- Gaps and Investment Requirements
- Energy affordability
- Food security (biomass use)

Scenarios Review

Main scenarios developed based on the following Policy assumptions:

- **Reference:** Middle of the Road scenario (Shared Socioeconomic Scenario 2 (SSP2))
- **Paris NDC continued ambition:** regional CO_2 emissions caps based on national Paris pledges plus continued actions post-2030
- **Paris to 2ºC:** regional CO_2 emissions caps based on national Paris pledges plus enhanced ambitions post-2030 to reach the 2ºC goal

Sub-scenarios developed based on the following Technology assumptions:

- **Reference:** Middle-of-the-road scenario (SSP2*)
- **Advanced renewables:** Reduced capital costs for solar, wind, and geothermal
- **Low-cost nuclear:** Lower capital costs reflective of small modular reactors
- **Advanced CCS:** Improved capture rate, reduced storage costs

Technology		Reference assumptions	Advanced assumptions
Renewables	Solar	Capital costs decline about 25% by 2050	Capital costs decline more than 60% by 2050
	Wind	Capital costs decline about 20% by 2050	Capital costs decline more than 60% by 2050
	Geothermal	Capital costs less than 10% by 2050 Only hydrothermal resources	Capital costs decline about 20% by 2050 New enhanced geothermal system (EGS) resources (regional specific supply curves)
Nuclear		2010 $5,501/kw 2030 $5,307/kw 2050 $5094/kw	Lower capital costs that reflect the small module reactors (SMR) Advanced assumption is about 35% lower than the reference assumption
CCS		CO2 capture rate: 85% in 2020, increase to 95% by 2100	Higher CO2 capture rate: 99% Lower costs of carbon storage (region-specific) that are in line with SSP5 assumptions

Reference and advanced Technology assumptions

Model Results
Investment needs

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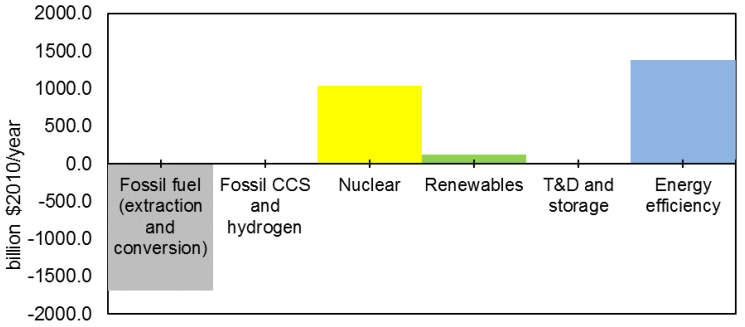
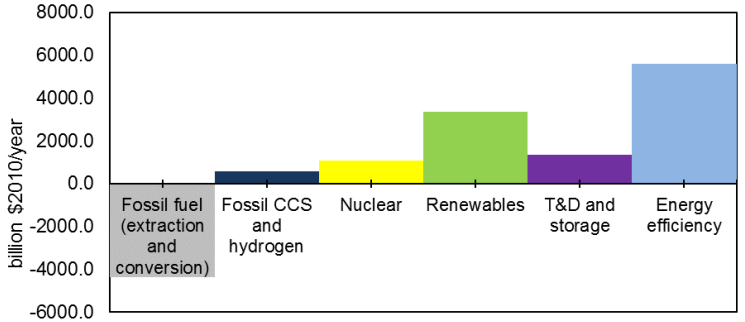
- Increased required investments for renewables under the NDC and P2C scenarios.
- Investments in transmission & distribution and energy storage, along with CCS systems increase substantially under the P2C scenario.
- Fossil fuel extraction & conversion have the highest share of investments in energy under the reference and NDC scenarios.

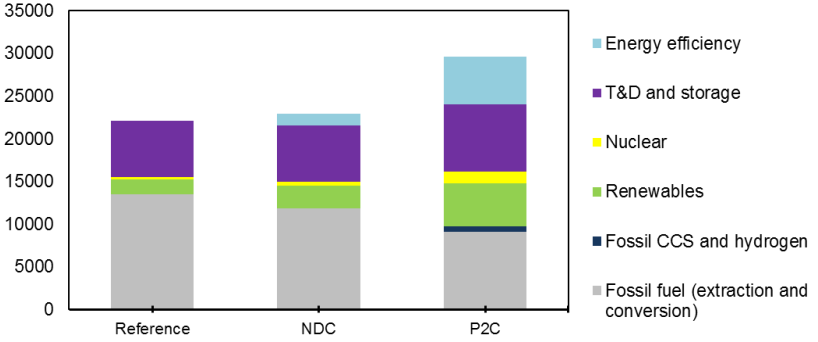
Required investments in UNECE
Difference NDC and Reference



Required investments in UNECE
Difference P2C and Reference



Total Investment needs 2020-2050 in UNECE (billion $2010)



Investments in Renewables (UNECE):
REF: 1664 bn $2010/year
NDC: 2702 bn $2010/year
P2C: 5026 bn $2010/year

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More on GERE:
http://www.unece.org/energy/se/gere.html

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Thank you!

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