

**University of Debrecen**

**GLOBAL RENEWABLE ENERGY TRENDS AND HUNGARY**

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Assistant lecturer

17<sup>th</sup> „Building Services, Mechanical and Building Industry Days”  
International Conference,  
13-14 October 2011, Debrecen, Hungary

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**World population**

*Figure 1: Population by major region [1]*

Region	2008 (Million)	2035 (Million)
Africa	~1000	~1600
India	~1100	~1400
China	~1300	~1400
Other Asia	~1000	~1400
OECD Europe	~500	~550
Latin America	~400	~500
OECD North America	~400	~500
E. Europe/Eurasia	~300	~350
Middle East	~200	~250
OECD Pacific	~100	~150

Sources: UNPD and World Bank databases; IEA analysis.

2008 - 2035	1.5% / year in 1980-2008
+ 0.9% / year on average	1.3% / year in 1990-2008
2008: 6.7 billion	1.1% / year in 2008-2020
2035: 8.5 billion	0.7% / year in 2020-2035

**Primary energy**

Region	2008 (%)	2035 (%)
Africa	~50	~50
India	~50	~50
Other Asia	~50	~50
Latin America	~50	~50
China	~50	~50
Middle East	~50	~50
European Union	~50	~50
Japan	~50	~50
United States	~50	~50
Russia	~50	~50

*Figure 2: Per-capita primary energy demand by region as a percentage of 2008 world average [1]*

**Population, primary energy, CO2**

Region	2008 (%)	2035 (%)
Africa	~50	~50
Other Asia	~50	~50
India	~50	~50
Latin America	~50	~50
China	~50	~50
OECD	~50	~50
Middle East	~50	~50
E. Europe/Eurasia	~50	~50

*Figure 3: Per-capita energy-related CO2 emissions as a percentage of 2008 world average [1]*

**Renewables vs Nuclear energy**

**Scenarios were raised before Fukushima**

Region	Year	Renewables (%)	Nuclear (%)
World	2008	19%	14%
	2020	24%	14%
	2035	32%	14%
OECD	2008	17%	21%
	2020	24%	22%
	2035	33%	23%
Non-OECD	2008	21%	5%
	2020	23%	7%
	2035	31%	8%

*Figure 4: Share of nuclear and renewable energy in total electricity generation by region in the New Policies Scenario [1]*

## Renewables vs Nuclear energy

### Scenarios were raised before Fukushima

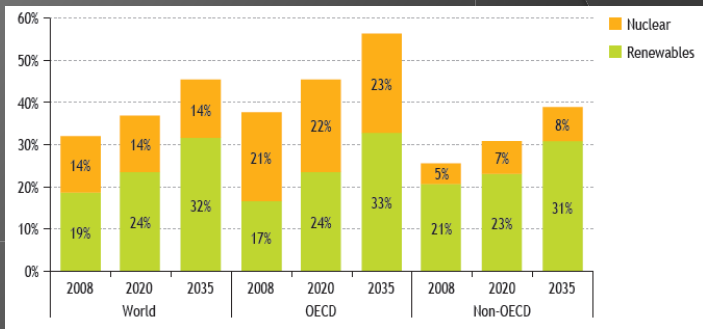


Figure 4: Share of nuclear and renewable energy in total electricity generation by region in the New Policies Scenario [1]

## Renewables vs Nuclear energy

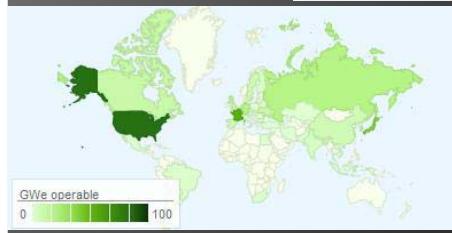


Figure 5: Operable and planned nuclear capacity worldwide measure in GW of electric power [5]

## Renewables vs Nuclear energy

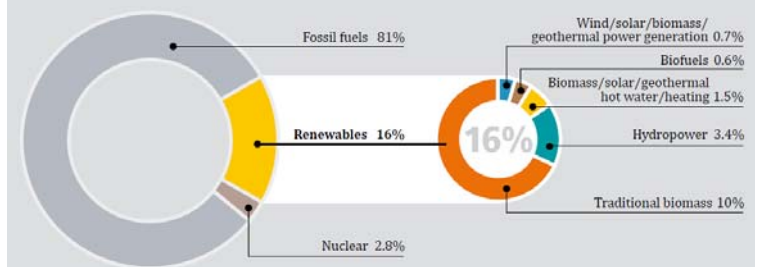
### After Fukushima

*"Germany will shut all its nuclear reactors by 2022, parties in Chancellor Angela Merkel's coalition government agreed on 30th May 2011, in a reaction to Japan's Fukushima disaster that marks a drastic policy reversal. It's definite. The latest end for the last three nuclear power plants is 2022. There will be no clause for revision."*  
 (Environment Minister Norbert Rottgen, Germany, 30 May 2011)

*"The government's basic stance on energy is to reduce dependence on nuclear power and seek the best mix of energy sources,"*  
 (New Japanese Trade and Industry Minister Yoshio Hachiro, Dow Jones, Tokyo, Japan, 2 September 2011)

## Renewables now

Figure 6: Renewable energy Share of Global final energy consumption, 2009 [2]

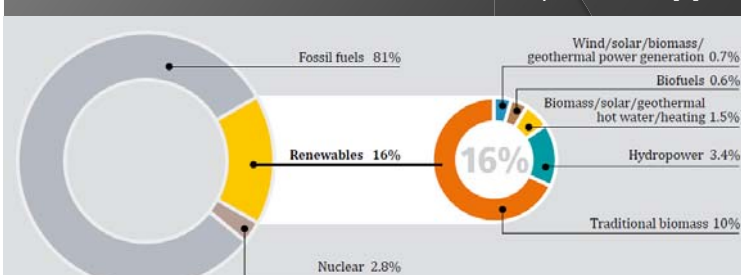


### 16% of global final energy consumption

- 10% traditional biomass
- 3,4% hydropower
- 2,8% all other renewables

## Renewables now

Figure 6: Renewable energy Share of Global final energy consumption, 2009 [2]



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## Renewables in the future

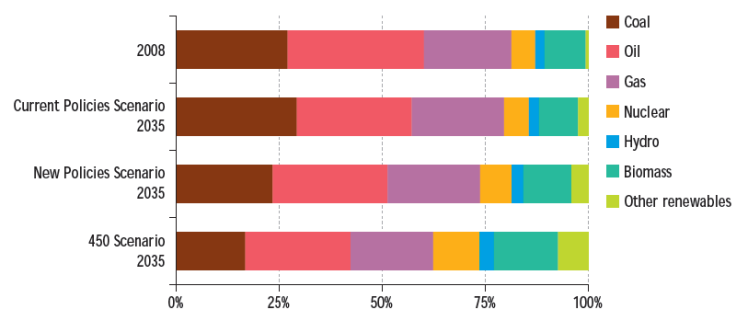


Figure 7: Shares of energy sources in world primary demand by scenario, 2009 [1]

## EU vs Hungary

For example the share of renewable in electricity generation 2009

- Latvia: 36%
- Sweden: 34%
- Austria: 27%
- ...
- Hungary: 7,3% (3,3% in 1999)
- **EU27: 9% (5,5% in 1999)**

## Visegrad's Four

For example:

Share of renewable in electricity generation 2009

- Hungary: 7,3%
- Slovakia 7,2%
- Poland 6,6%,
- Czech Republic 5,7%,
- **EU27: 9% (5,5% in 1999)**

## Summary

- Renewable energy policy
- Primary energy goals:
  - Security of supply
  - Competitiveness
- Sustainability

## Acknowledgement

- [1] **International Energy Agency: World Energy Outlook 2010**, ISBN: 978 92 64 08624
- [2] **REN21 - Renewable Energy Policy Network for the 21<sup>st</sup> Century : Renewables 2011 GLOBAL STATUS REPORT**
- [3] **HUNGARY'S RENEWABLE ENERGY UTILISATION ACTION PLAN on trends in the use of renewable energy sources until 2020**
- [4] **European Commission: Renewables make the difference 2011**, ISBN 978-92-79-16988-5
- [5] [http://www.stanford.edu/group/gamechangers/Game\\_Changers\\_for\\_Nuclear\\_Energy/The\\_implications\\_of\\_Fukushima.html](http://www.stanford.edu/group/gamechangers/Game_Changers_for_Nuclear_Energy/The_implications_of_Fukushima.html)
- [6] <http://www.origo.hu/idojaras/20110411-megujulo-energia-magyarorszagon-nem-eleg-a-duplazas.html>
- [7] <http://e.nikkei.com/e/fr/tnks/Nni20110902D02JF673.htm>
- [8] <http://www.bbc.co.uk/news/world-europe-13592208>
- [9] <http://progressivefix.com/the-future-of-nuclear-power-after-fukushima>

Thank you for your attention!

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