

# Finland, the nuclear waste country

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Suomen  luonnonsuojeluliitto

# Finland has it all

- Olkiluoto 3, the pilot reactor after 20 years of nearly non-existent construction in Europe
  - Even France is holding it's own pilot reactor to wait for Finland
- Uranium mining prospects
  - All West-European mines have been closed
- Final disposal site at Olkiluoto
  - Finland is trying to be the first in the world to solve the nuclear waste issue



# What's new?



- The incident at a final disposal site in Asse II, Lower Saxony, must be noted. Stored capsules began to leak after just 30 years, even though they were supposed to be stored at least some thousands of years.
- New reactors produce super-nuclear waste which is more problematic than ever in terms of processing and final disposal
  - Possibility to utilize the fuel further making the waste hotter and more fragile



NPPs  
2 operating  
1 in construction

Olkiluoto, Eurajoki, Finland

800m

Nuclear waste  
depository

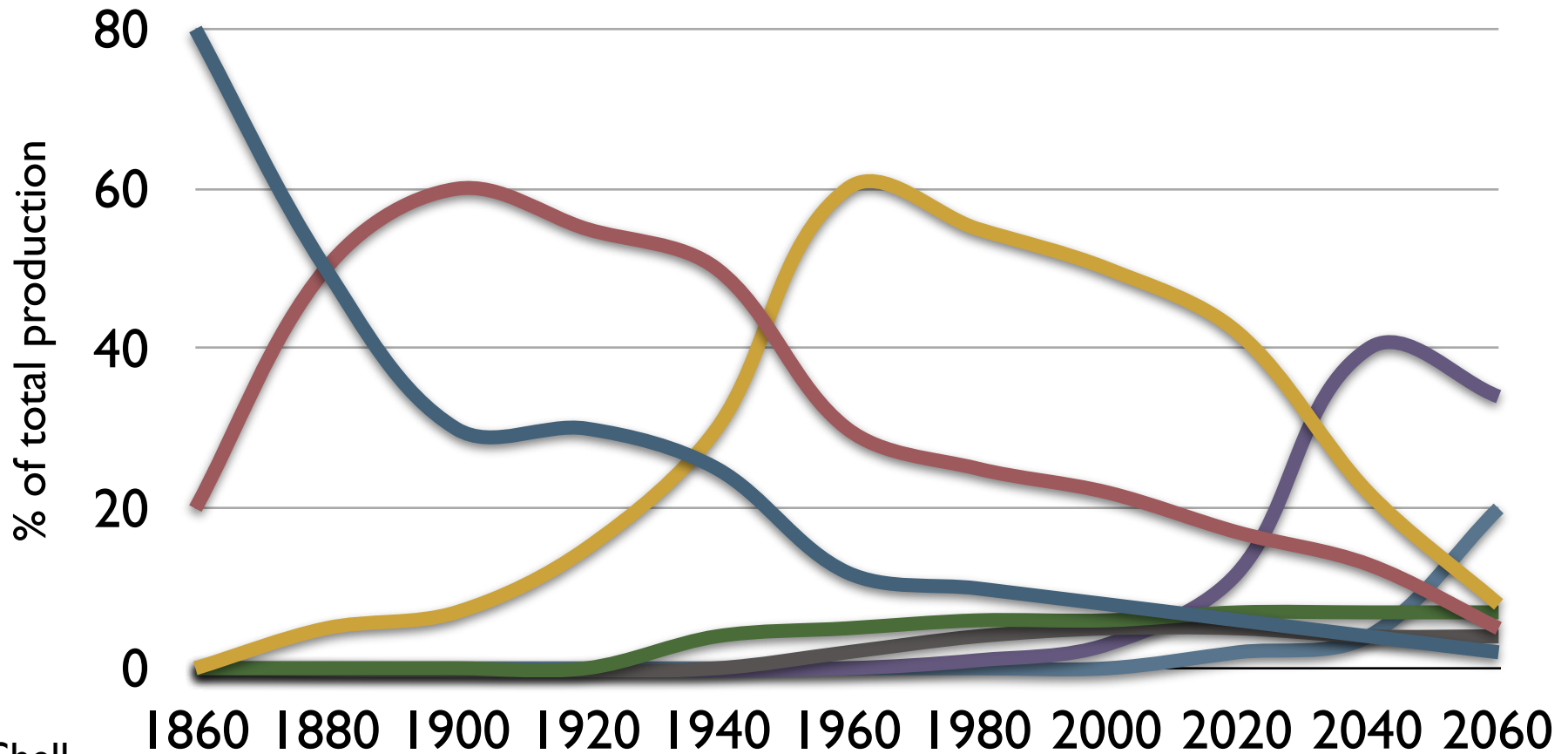
# Final disposal of nuclear waste is still completely unresolved



- A survey commissioned by the Radiation and nuclear safety authority (STUK) has evaluated the long-term safety of the Posiva project. According to the report written by geologist, professor Saarnisto long-term safety of the final disposal site is speculative and is not based on scientific facts.
- The depth to which permafrost can extend during an ice age has been incorrectly estimated.
- The reversibility and controllability of nuclear waste are not possible, as the nuclear waste chamber will be either partially or wholly submerged in water or continental ice for most of the timeframe being examined
- Earthquake prediction is inadequate.

# Which is the next king technology?

- Trad. biomass
- Oil, gas
- Nuclear
- Unidentified renewables
- Coal
- Hydro
- identified renewables

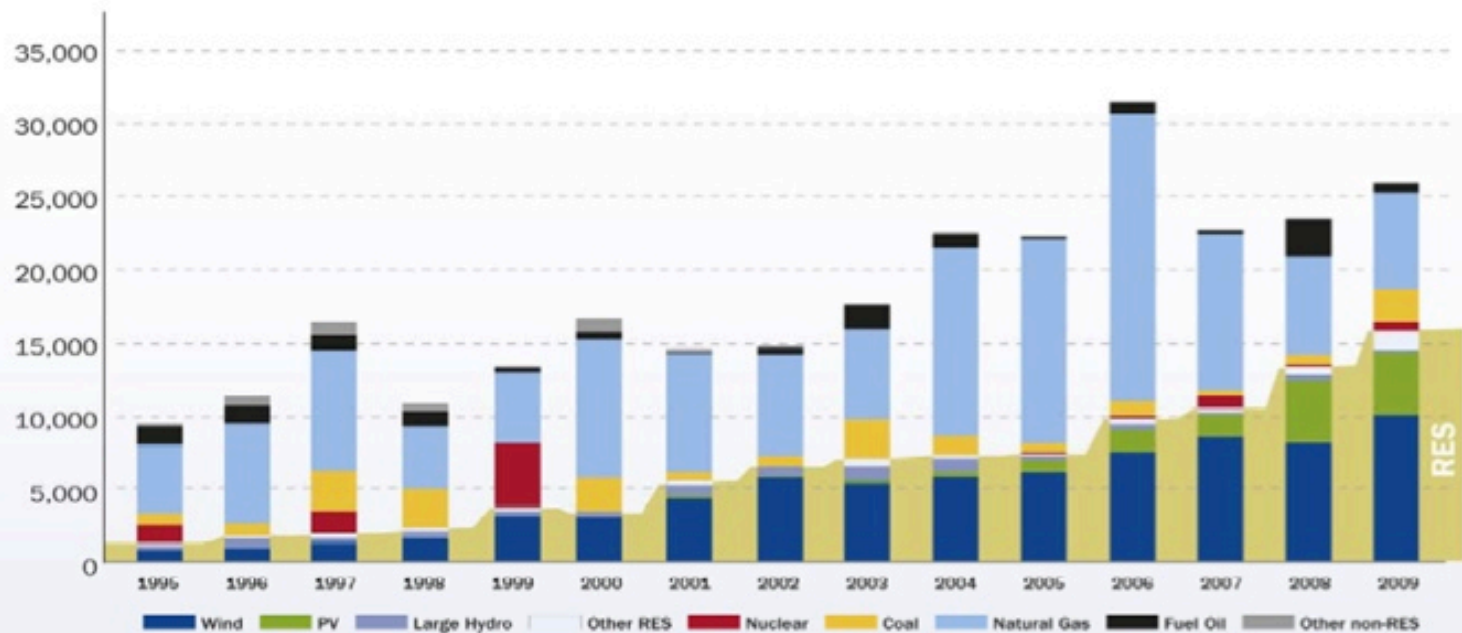


# Renewables are expanding rapidly

## Cumulative installations



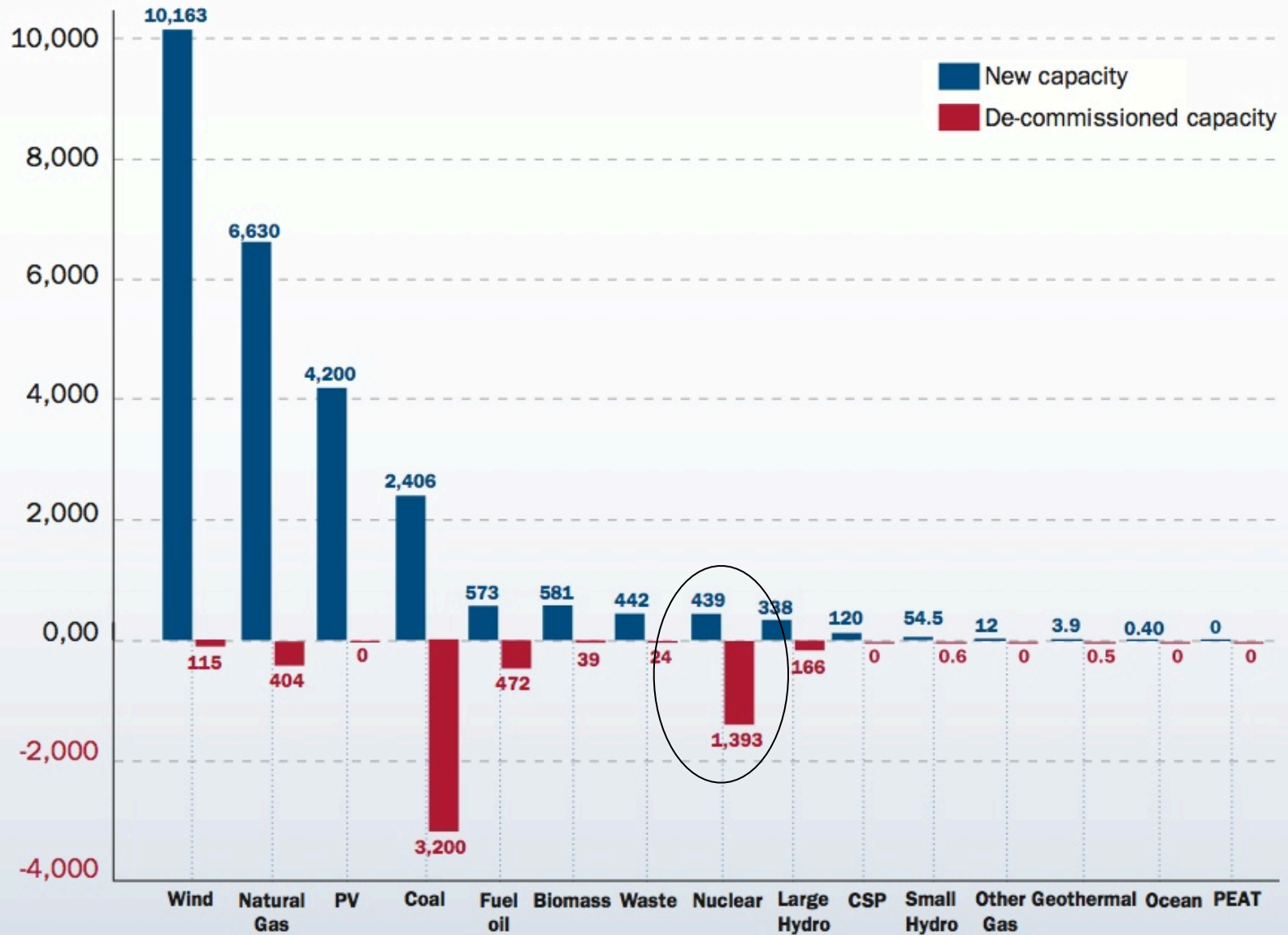
### New installed capacity per year 1995 - 2009



# New capacity in EU 2009

NEW INSTALLED CAPACITY AND DE-COMMISSIONED CAPACITY IN EU 2009 IN MW. TOTAL 25,963 MW

FIGURE 1.2





# The Olkiluoto 3 pilot reactor

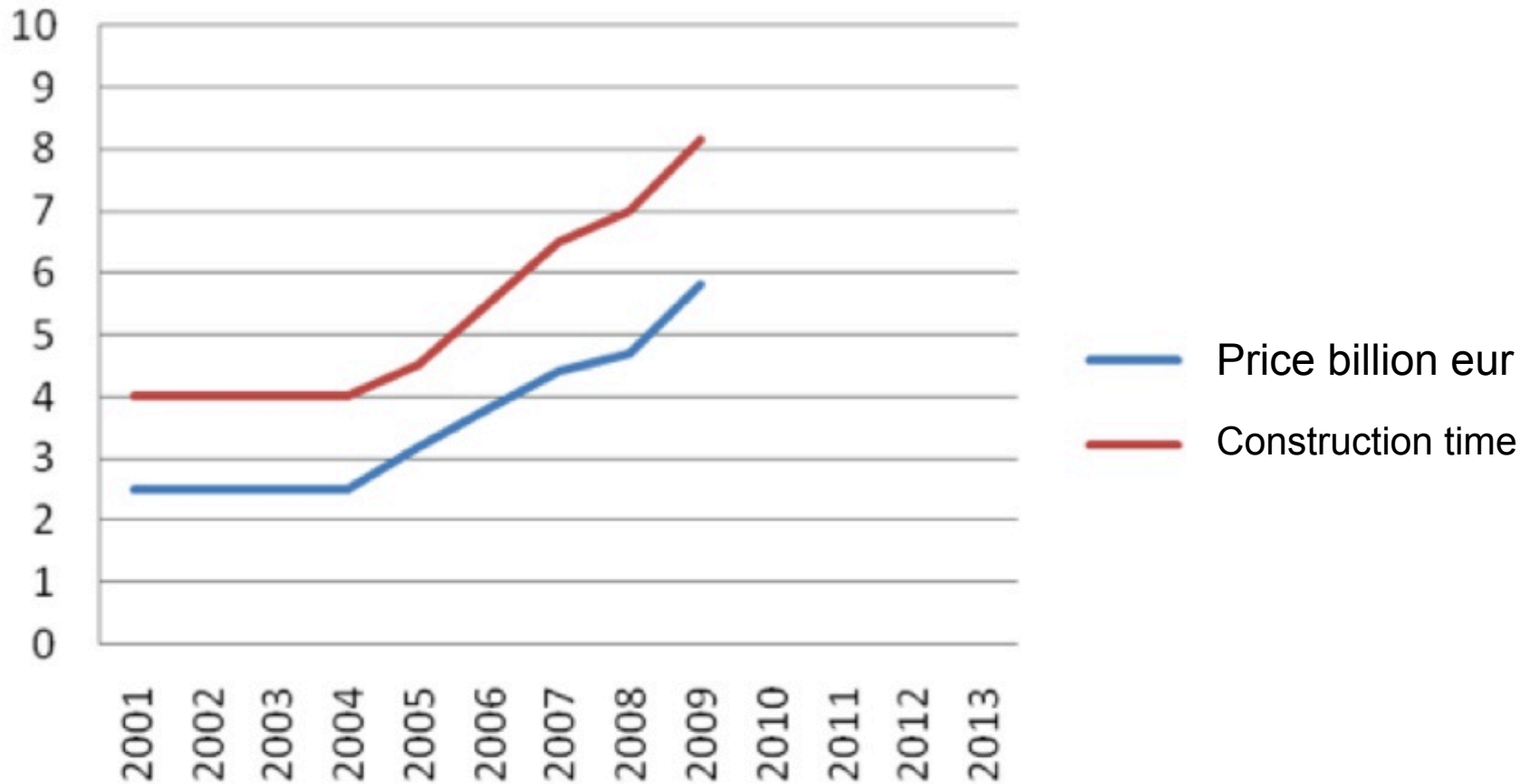
- Olkiluoto 3 is a big failure. In the preliminary debate, renewable energy sources appeared less favourable because of an unrealistic schedule and budgetary promises. Construction of the reactor has also lead to a major dispute between TVO and Areva.



- Olkiluoto 3 offers no assistance in reaching the Kyoto climate objectives, even though this was one of the arguments used to support the project.

- The price of electricity in Finland is now higher than if the alternative of renewable energy sources had been chosen.

## Olkiluoto 3: price and construction time



# Nuclear waste - final words

- A finished spent nuclear fuel depository would be by far the most long-term structure that mankind has ever been able to produce
- Just one Onkalo, 'Hiding place' is nothing: the world would need hundreds of Onkalos
- If Olkiluoto 3 is started some day, Finland will be producing the highest amount of nuclear waste per capita (with France)
- Potential of renewables is enough for electricity just after 2030 - why use the old technology?

# Thank you!

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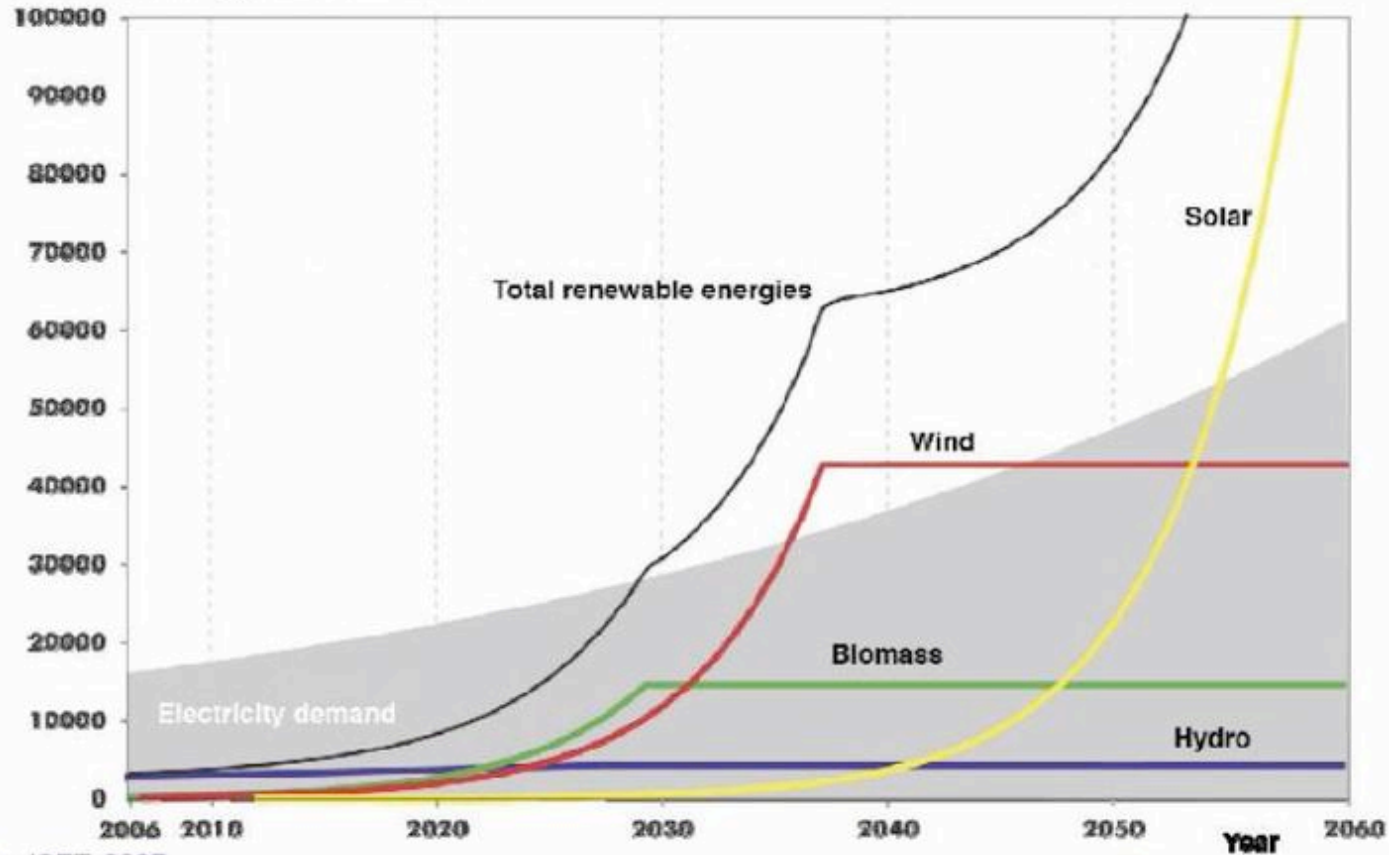
**Tel. 050 535 3205**



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# Potential of renewable energies in power generation

Global electricity generation in TWh



Source: ISET, 2007

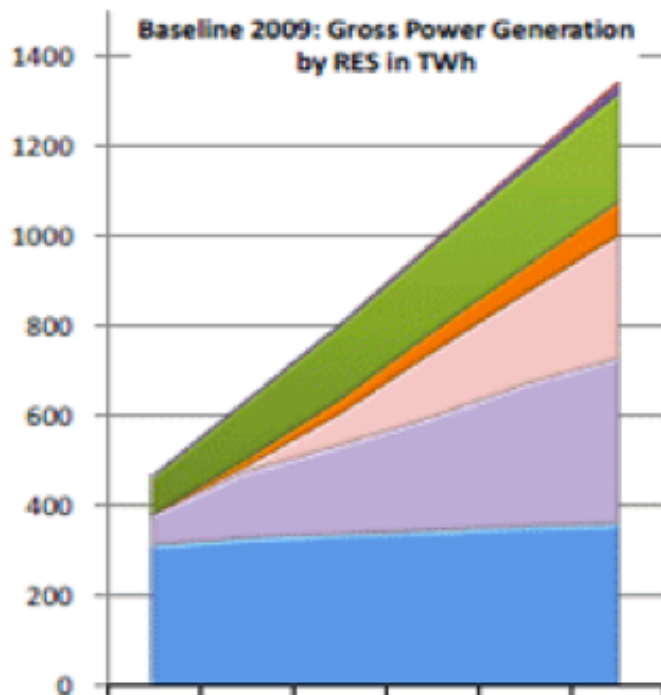
UNIKASSEL  
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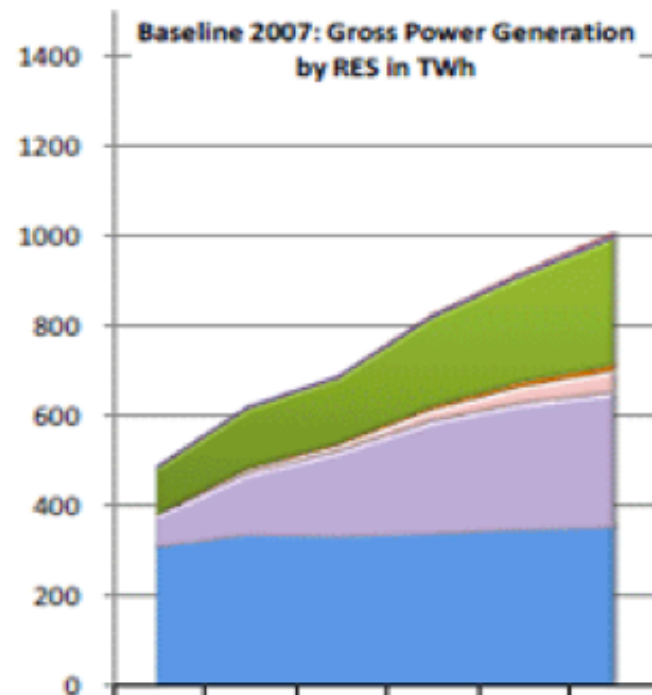
Fraunhofer  
IWES

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FIGURE 13: STRUCTURE OF RES POWER



	2005	2010	2015	2020	2025	2030
Tidal, etc.	0	0	1	3	6	9
Geothermal	5	6	6	7	11	19
Biomass/waste	84	127	164	191	218	241
Solar	1	17	32	46	60	75
Wind offshore	2	14	72	146	204	276
Wind onshore	68	147	197	253	316	368
Hydro	307	323	332	339	349	355



	2005	2010	2015	2020	2025	2030
Tidal, etc.	0	0	0	2	3	5
Geothermal	8	8	8	8	9	9
Biomass/waste	102	133	145	196	235	282
Solar	1	4	6	9	13	17
Wind offshore	0	9	13	24	36	46
Wind onshore	70	136	189	247	279	296
Hydro	307	333	329	336	345	351