

# Energy Group of the European Physical Society (Lisbon Meeting, Nov 2014)

## Current Energy Policy and Energy Market Situation in Finland

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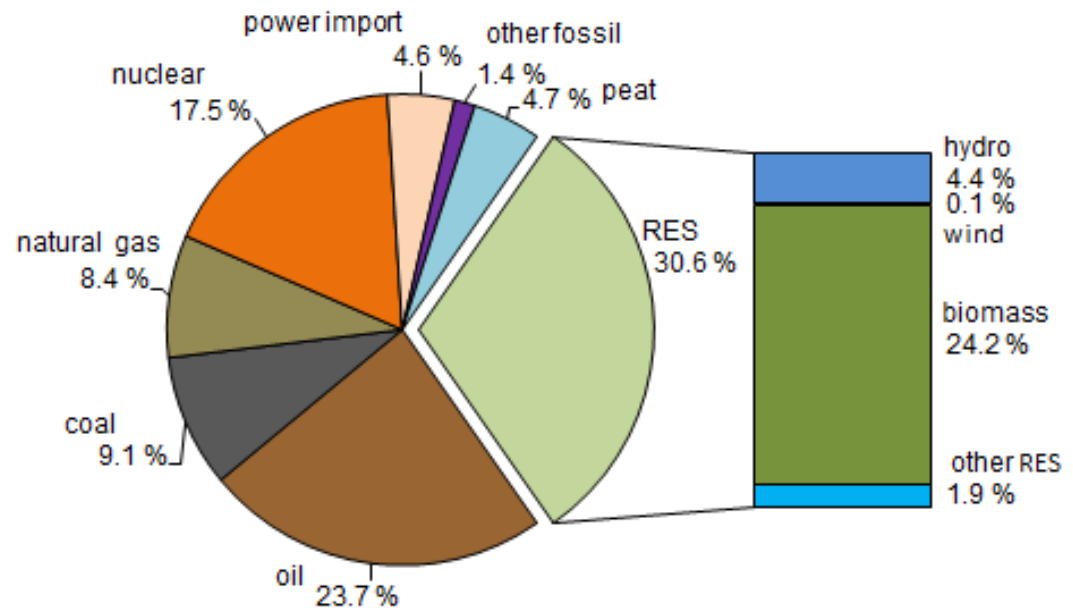
# Content of presentation

- Outlook to Finnish energy system
- Recent news and updates of RES plans
- Future prospects of nuclear power
- Final notes

# Finland's energy system

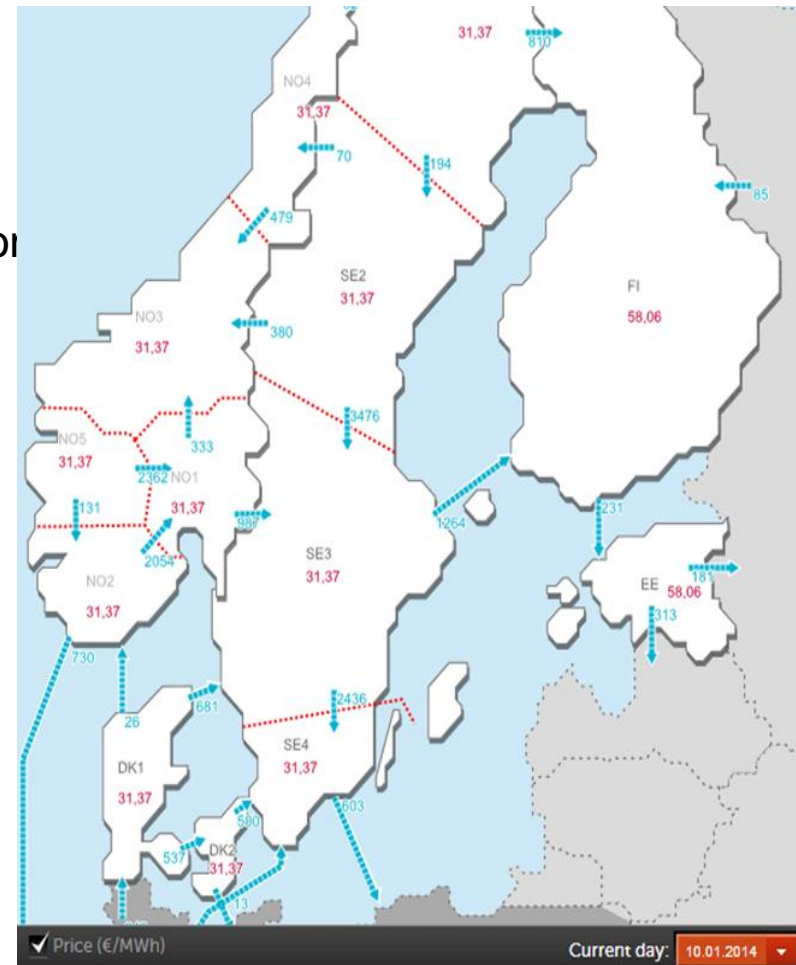
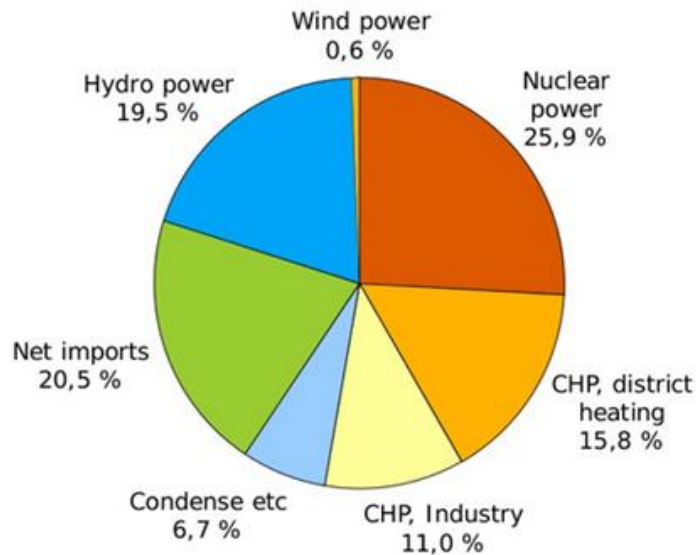
- Primary energy supply (PES) in 2012, 1380 PJ (~381 TWh)
- District heating (DH) 50% of heat demand of buildings (93% in Helsinki)
- CHP accounts for 70% of district heat, RES in CHP more than 20%
- Pulp and paper industry used more than half of energy in industry (68% from biomass)

- **EU 2020 Target:**  
**38% RES**  
(31% RES in 2012)



# Finland's power system: Diverse but depended on imports

- Total power demand 85 TWh (2012)
- CHP plants supplied 36% of power
- Share of RES-E 27% of power consumption (share of decarbonized 73%)



## RES scenarios: Bioenergy

- Biomass is the backbone of renewable energy plans, mostly used in connection with forest industry: economical without subsidies
- World's largest CFB gasifier 140 MW (provided by Metso) in operation, gasified residual wood replacing coal in CHP plant  
(Enabled by FiT of 83,5 €/MWh<sub>e</sub> + 50 €/MWh heat premium)
- Helsingin Energia is to replace 10% of coal by torrefied biomass (now imported, but plans to produce domestically)
- Second-generation biodiesel plants to recover the share of RES in transport (10% by 2020)
- Maximum potential of bioenergy estimated approx. 38% of total primary energy

## RES scenarios: Wind and solar PV

- Wind power is the most significant element in National Energy Policy
- Government's goal 2500 MW by 2020( end of 2013 only 480 MW installed)
- There are about 11000 MW of planned projects (of which 2200 MW off-shore), but licensing process is very slow: local people complain
- FiT today 83.5 €/MWh, early projects by 2015 105.30 €/MWh
- Off-shore wind will require a separate, larger FiT to be realized
- Solar energy has no FiT in Finland
- The largest solar PV plant to be delivered in 2015 by Helsingin Energia  
340 kWp plant at one centralized site but panels hired by environmental-friendly individuals (in less than 2 days all the panels found virtual owners!)

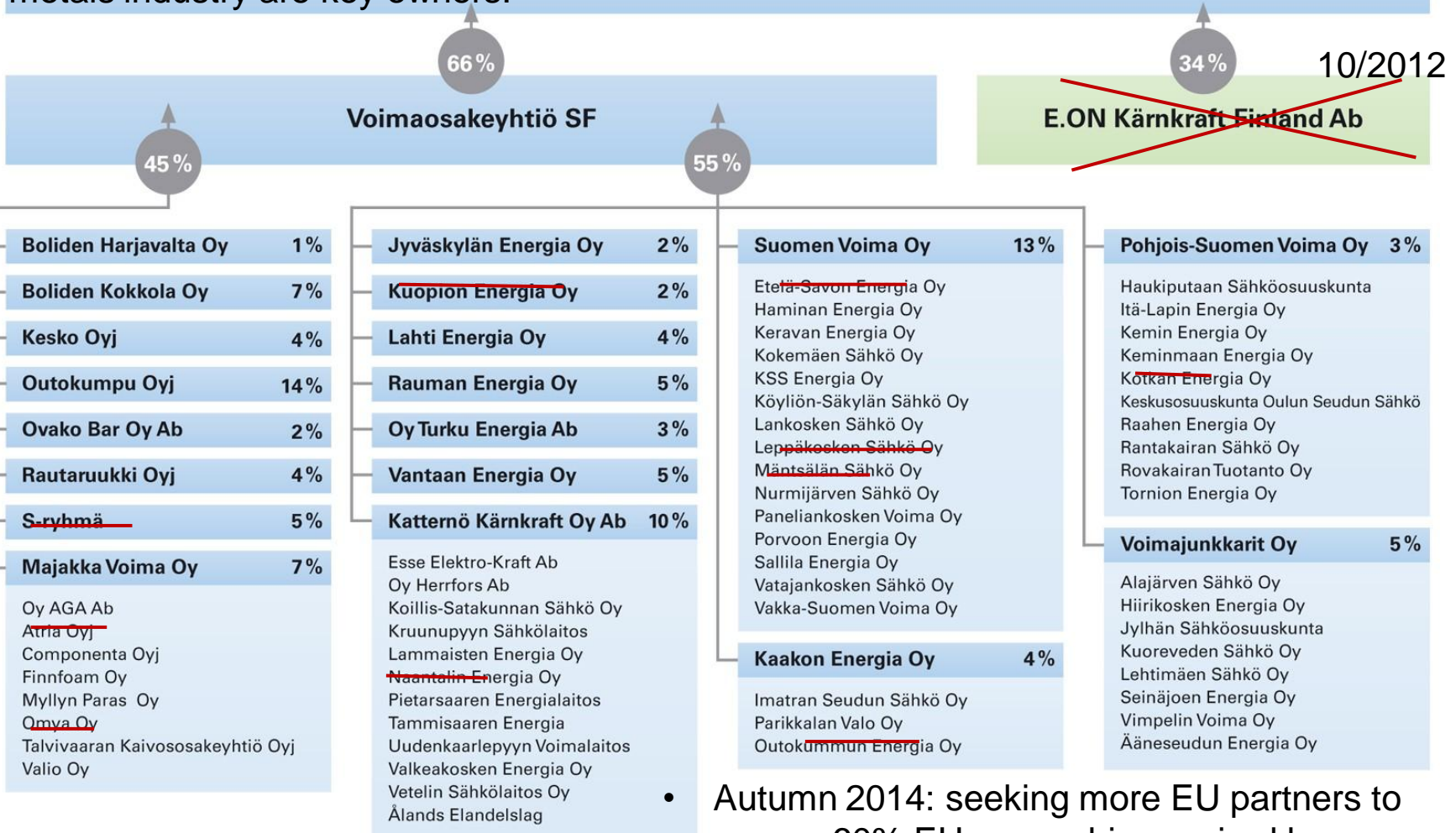
# Nuclear new-build: Uncertainty and political cancellations

- Existing Loviisa 1 and 2, small power upgrades → 2 x 510 MW, will run until 2027 and 2030
- Olkiluoto 1 and 2 applying extension → 2 x 860 MW until 2038
- **Olkiluoto 3** (1600 MW EPR): estimated on-line in 2018 (?)
- **Fennovoima** (1200 MW): E.On. Withdrawal in 2012 (34% ownership), new partner Rosatom 9/2013.
  - Government approved change in ownership in 9/2014, provided that 60% of ownership is from Finland & EU (for example Rautaruukki Steel company now sold to Sweden)
  - Parliament will vote again during this autumn (probably yes with narrower margin)
- **Olkiluoto 4** (1600 MW): the company TVO applied for permit extension by 5 years, Government said no in 9/2014 → unlikely that TVO goes ahead to start construction now (permit expires in 6/2015)

Municipal companies & metals industry are key owners.

# FENNOVOIMA

Rusatom overseas co-owner  
34-40%

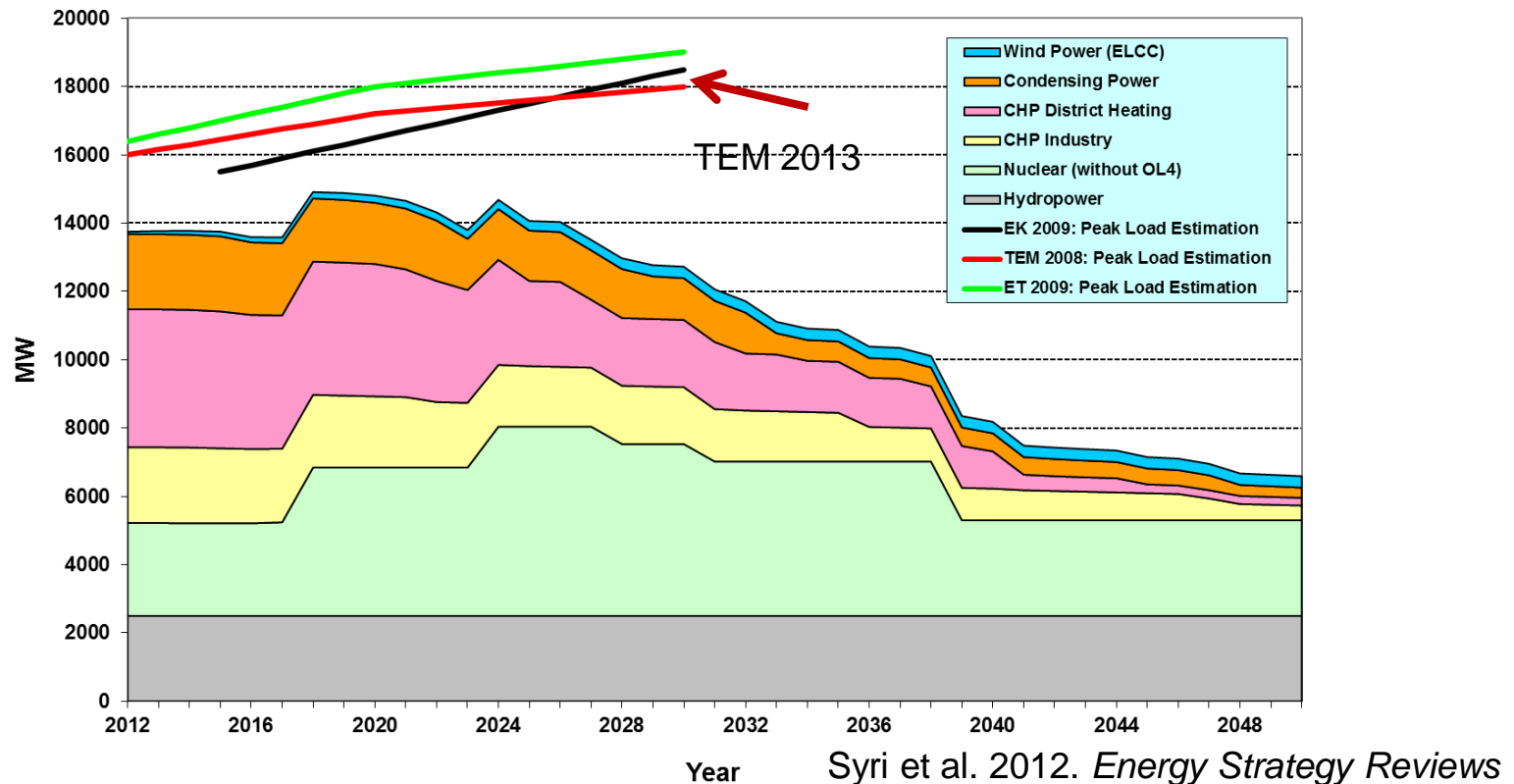


- Autumn 2014: seeking more EU partners to ensure 60% EU ownership required by Government. Parliament soon voting again.



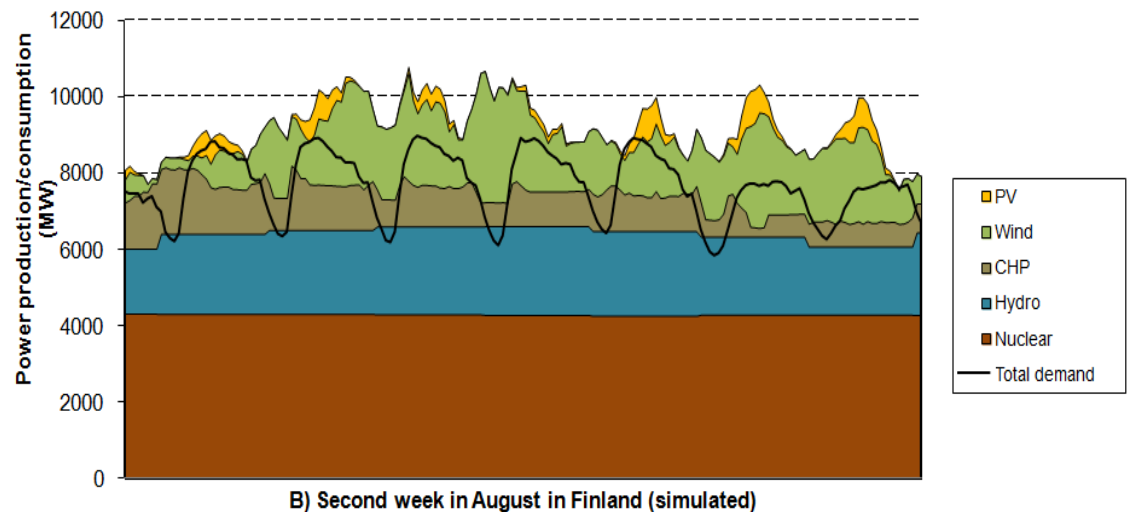
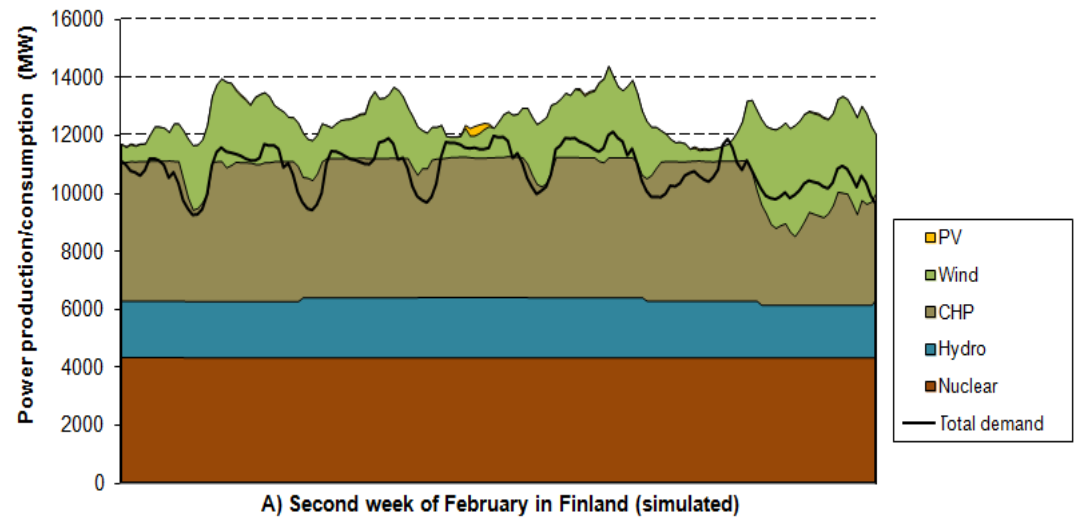
# Existing capacity and peak demand (OL3 and FV included)

- Nuclear plans updated 9/2014
- Wind power in peak demand calculated with Effective Load Carrying Capability (wind 1500 MW in 2020, 3000 MW in 2030)



# Is there any compromise between nuclear and wind?

- The setting under today's heat and power demand
- CHP as an interlinkage between power and heat sector (+ or -)
- The future of interconnection capacity and power market
- The future of wind in other Nordic countries (and Germany)
- Decarbonization or RES, how to support?
- National energy security



**Thank you for your attention!**