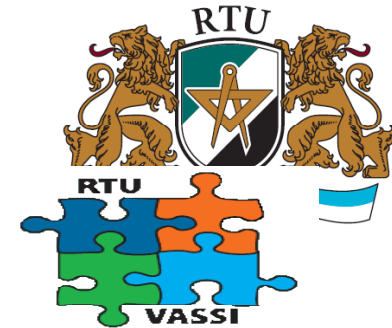




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Using biomass in Latvian energy sector. Analysis of target

Dr. **Dagnija Blumberga**, Dr. Marika Rosa
Francesco Romagnoli, Ilze Dzene
Riga Technical University

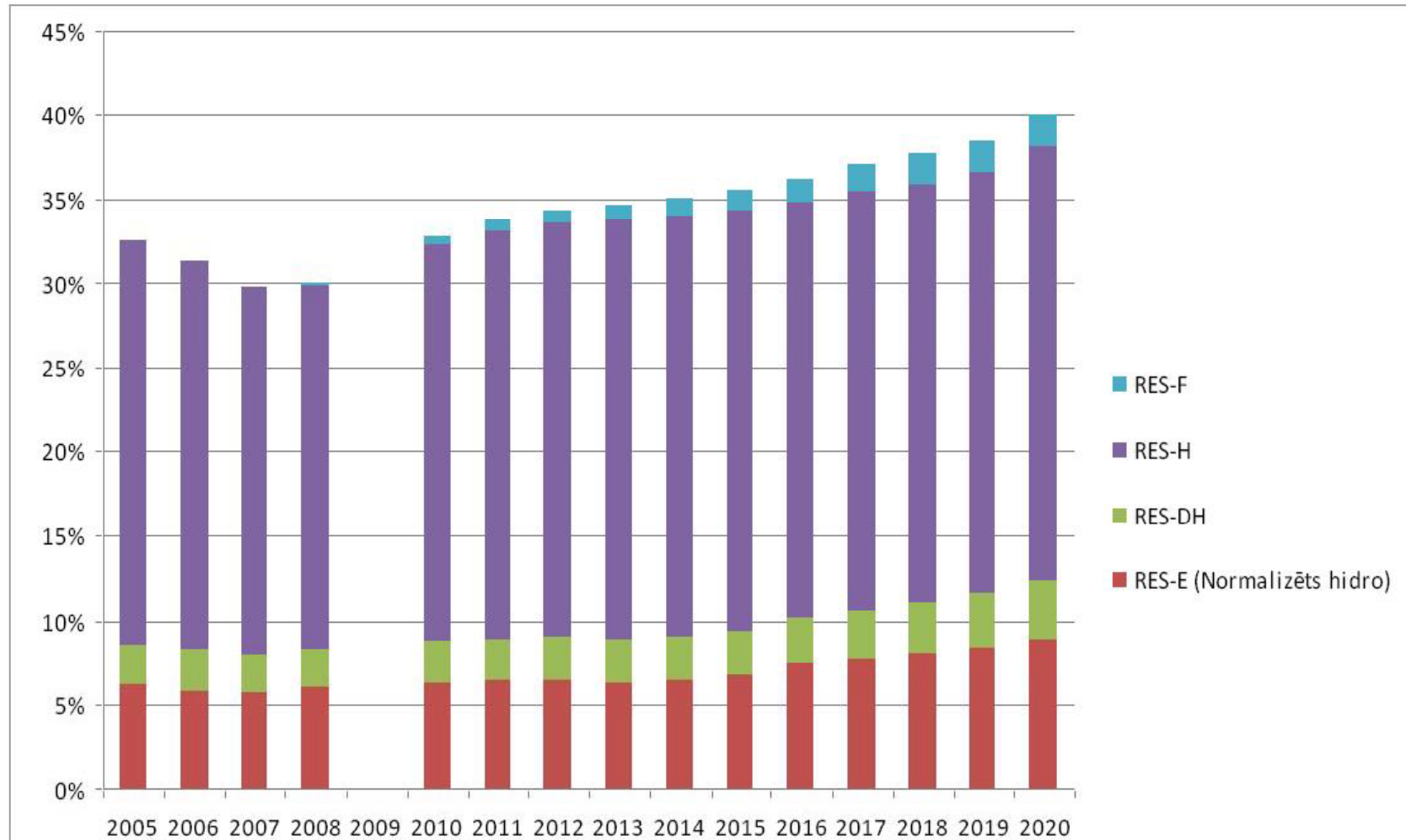


Development of Energy Sector in Latvia

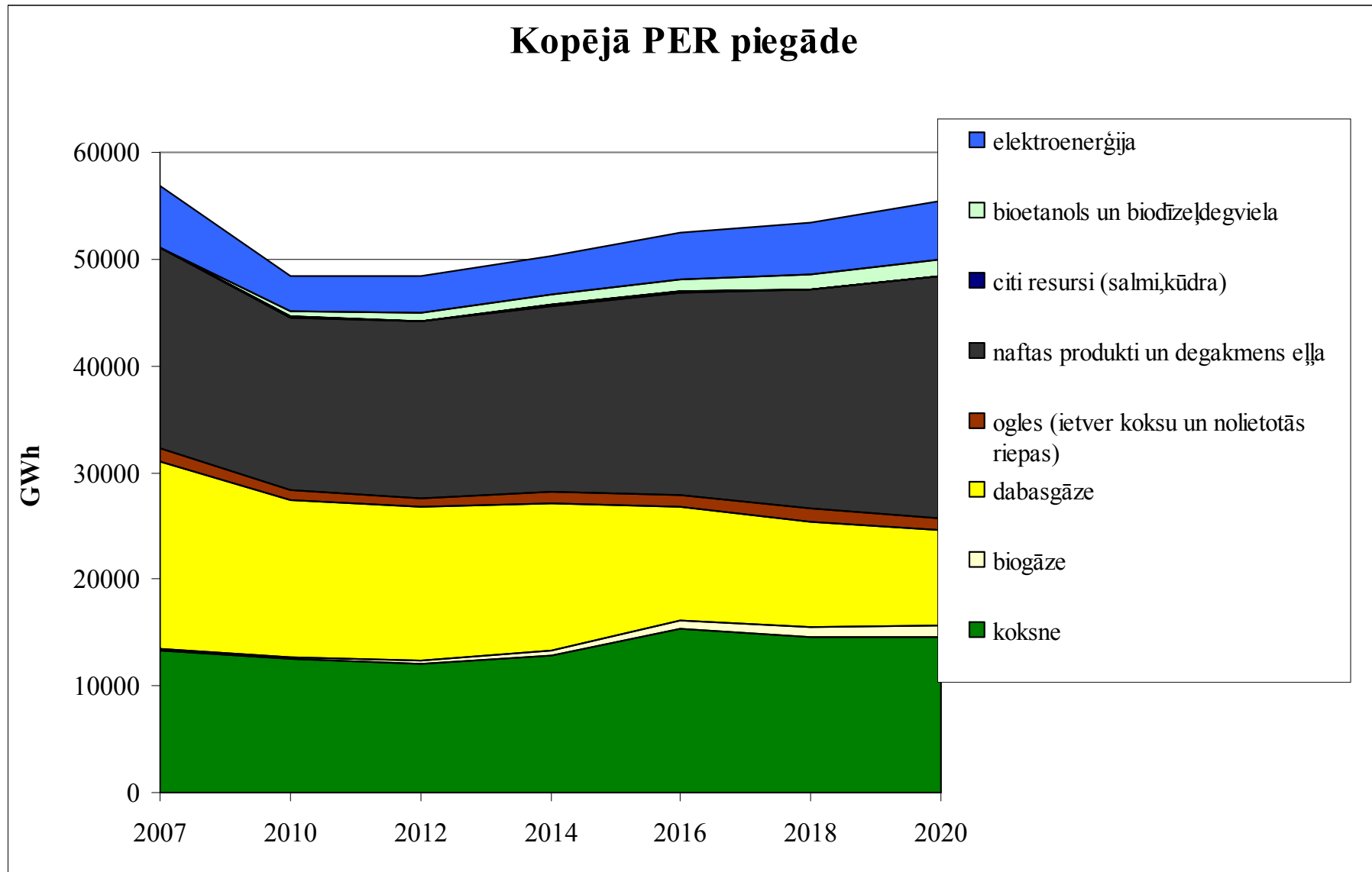
- Share of renewable energy resources in 2020
 - EU 20%
 - Latvia 40%

Is it possible for Latvia to reach target?

RES target for Latvia (info: Ministry of Economy December, 2009)



Primary Energy use. Alternative Scenario



Wood Fuel Use. What does it mean for Latvia

- Energy sector development by use
- Income from emission trading
- Regional development – unemployment and import
- Independence from energy resources out side
- Etc.

What do we have today

- 20 – 25 TWh/year of energy of wood fuel
 - From forest
 - From out of forest
 - From wood processing
 - Used wood
 - Wood logs from forest

Wood Fuel Users in Latvia

- Energy sources
 - DH boiler houses
 - CHPs
 - Households (individual users)
- Industry
- Agriculture
- +
- Export of wood fuel

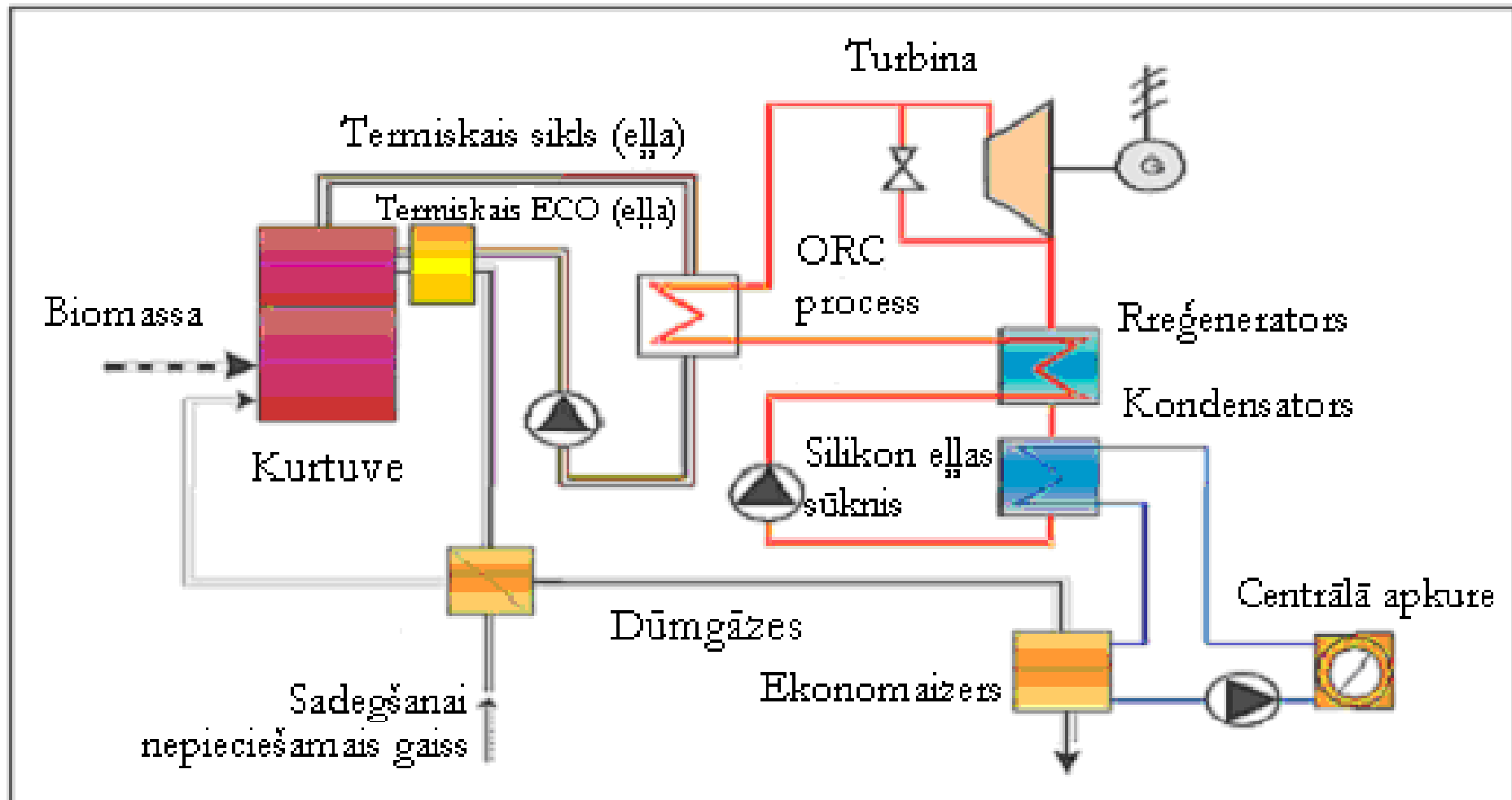
CHPs in Latvia

- Natural gas (ratio electricity /heat = 0,5 – 0,8)
~550 MWe
 - Riga TEC 1
 - Riga TEC 2
 - Imanta CHP
 - Small CHPs
- Wood fuel (ratio electricity /heat = 0,1) 2 MW
 - Daugavgriva
 - Kraslava
 - Jekabpils

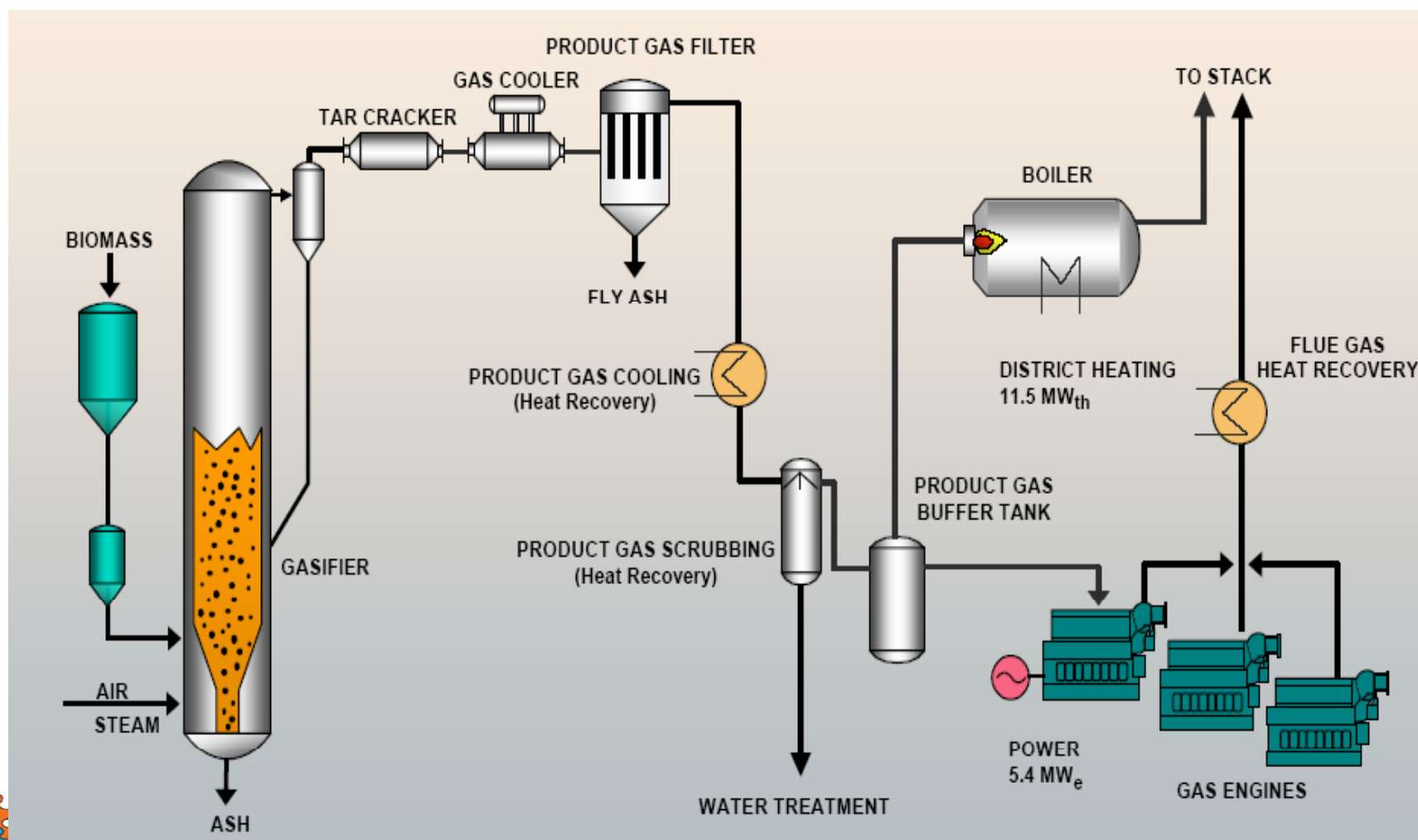
Development of energy sources for wood fuel in Latvia

- Alternative 1. Small CHP with steam turbines
- Alternative 2 CHP for large DH systems with high ratio electricity/ heat
- Alternative 3 Boiler houses of DH systems
- Alternative 4. Individual boilers for private houses

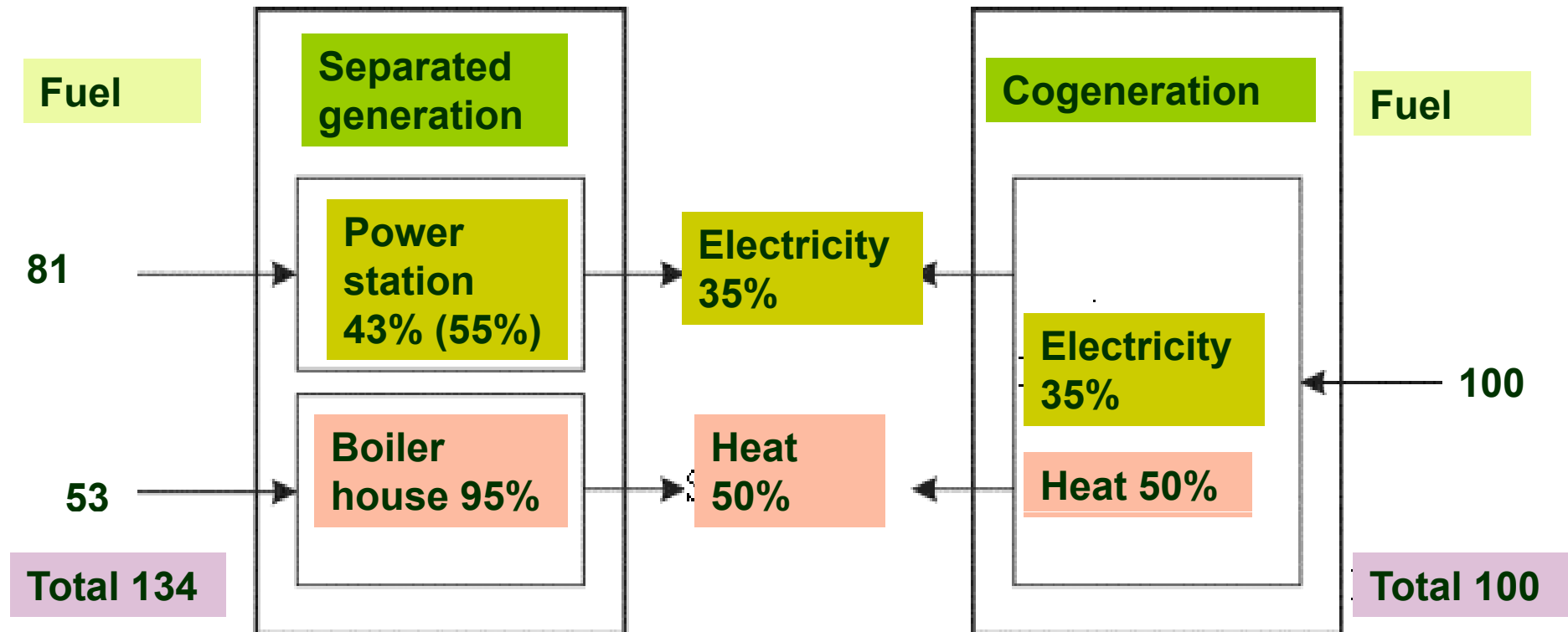
Alternative 1. Example of ORC $0,3 - 1,5 \text{ MWe}$; $\alpha = 0,16$



Alternative 2. Example of Biomass gasification. 11,5 MW_{th} + 5.4 MWe ; $\alpha = 0,5$



Alternative 3. Example



$$\text{Energy savings} = \frac{(134-100)}{134} = 25\% (15\%)$$

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Proposal for integration of wood fuel in energy sector in Latvia. Research results

■ Target:

- wood fuel used for electricity generation
→ max
- GHG emissions → min
- Increase of independence
- Increase of employment
- Reduction of import

Scenarios

A scenārijs.
Basic (A1, A2)

C scenārijs.
EU target (C1, C2)

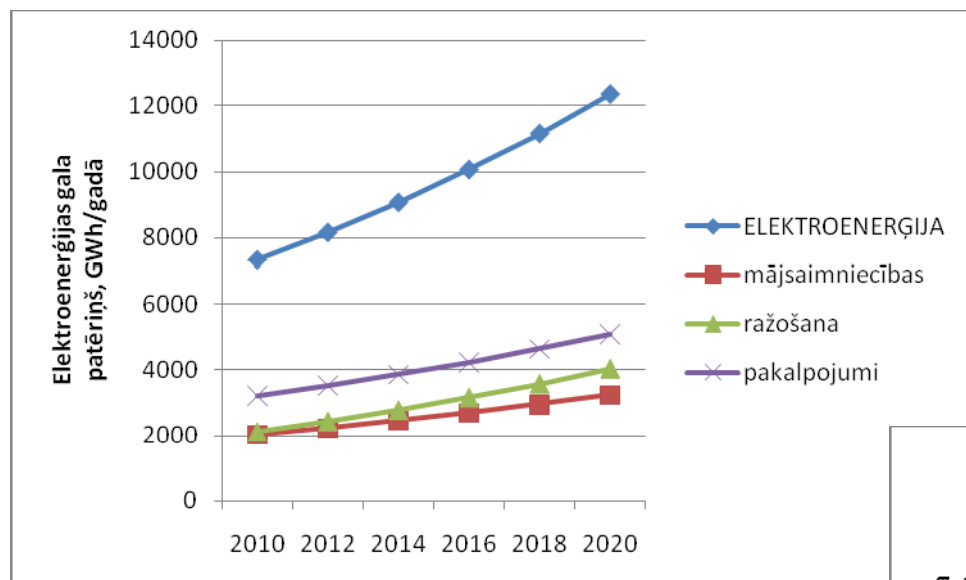
1 – Basic

2 – Energy efficiency

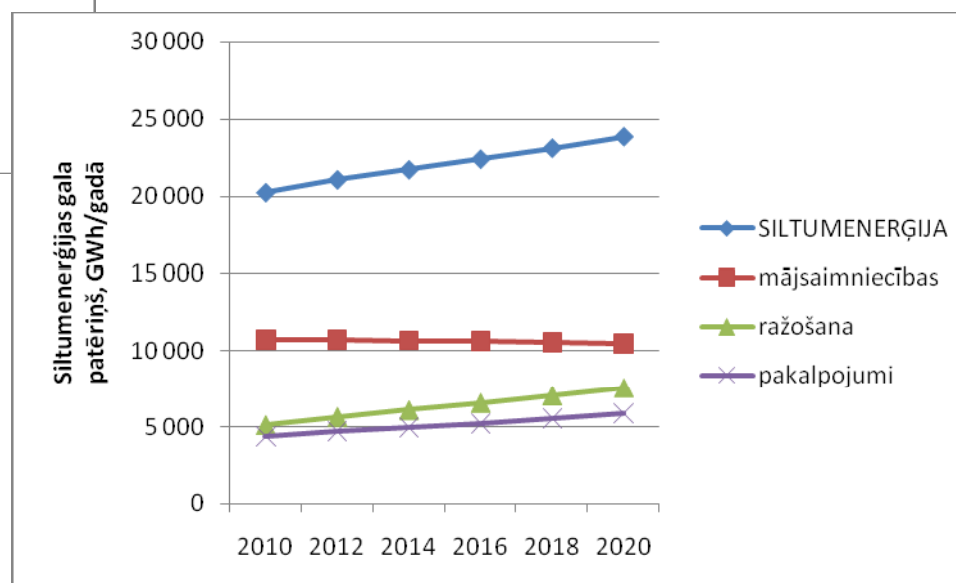
B scenārijs. Basic
– existing state policy
2006-2013 (B1, B2)

D scenārijs.
Green (D1, D2)

Basic scenarios

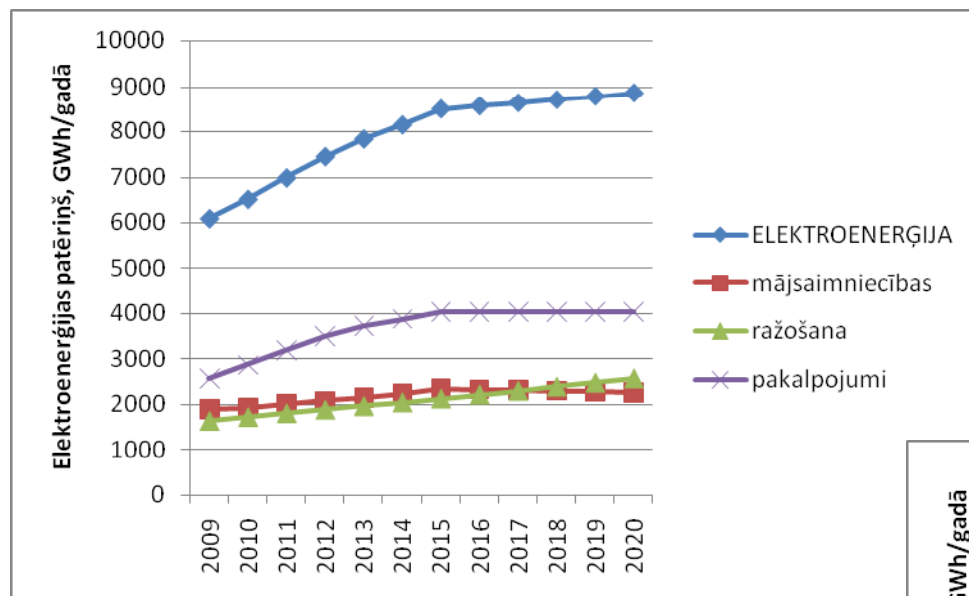


Electricity

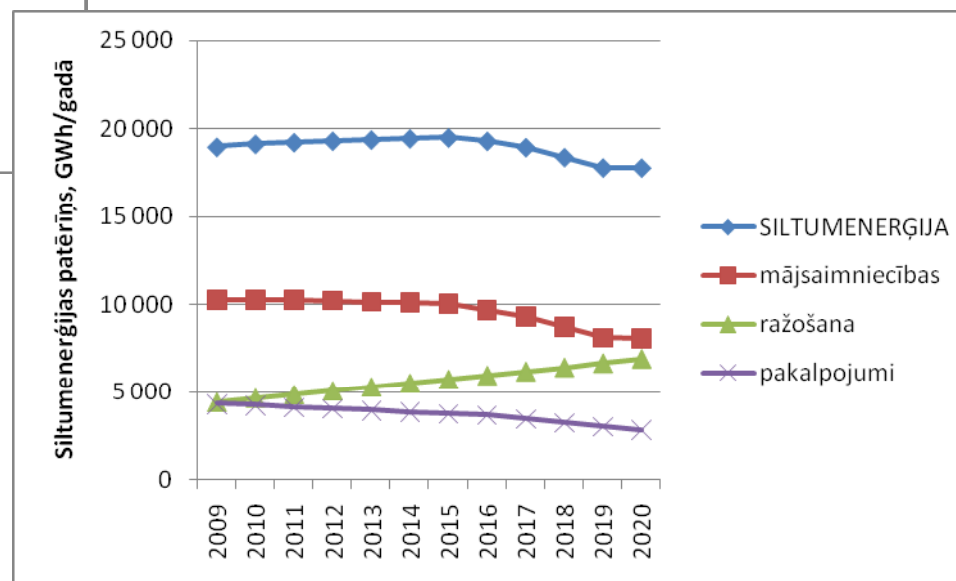


Heat energy

Energy Efficiency Alternative



Electricity



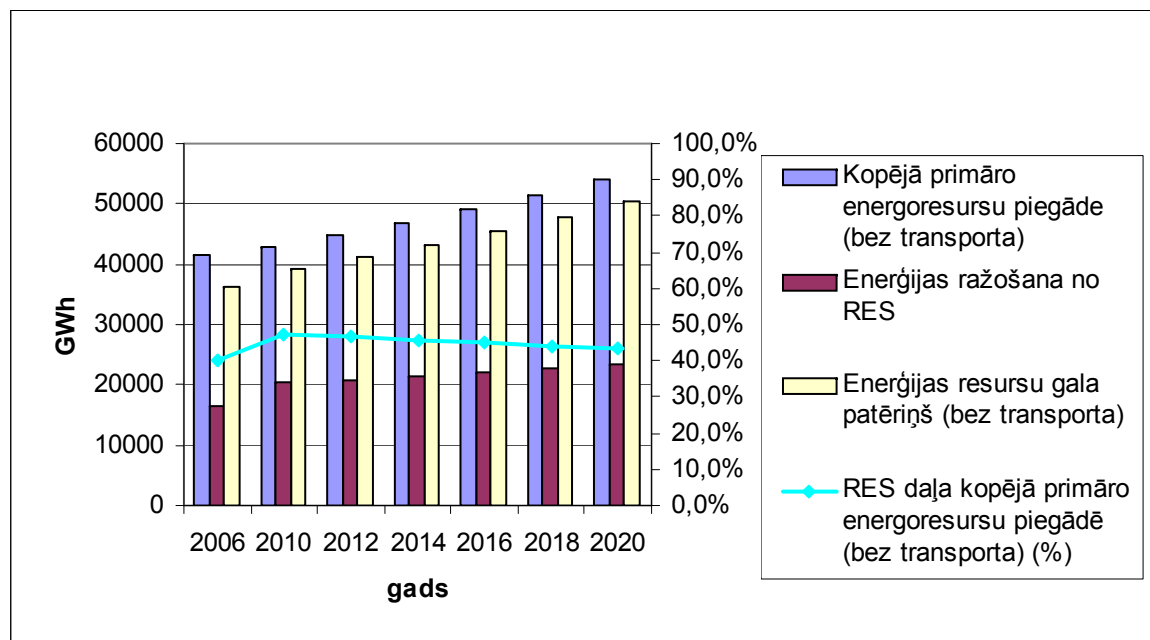
Heat energy

D2 scenario

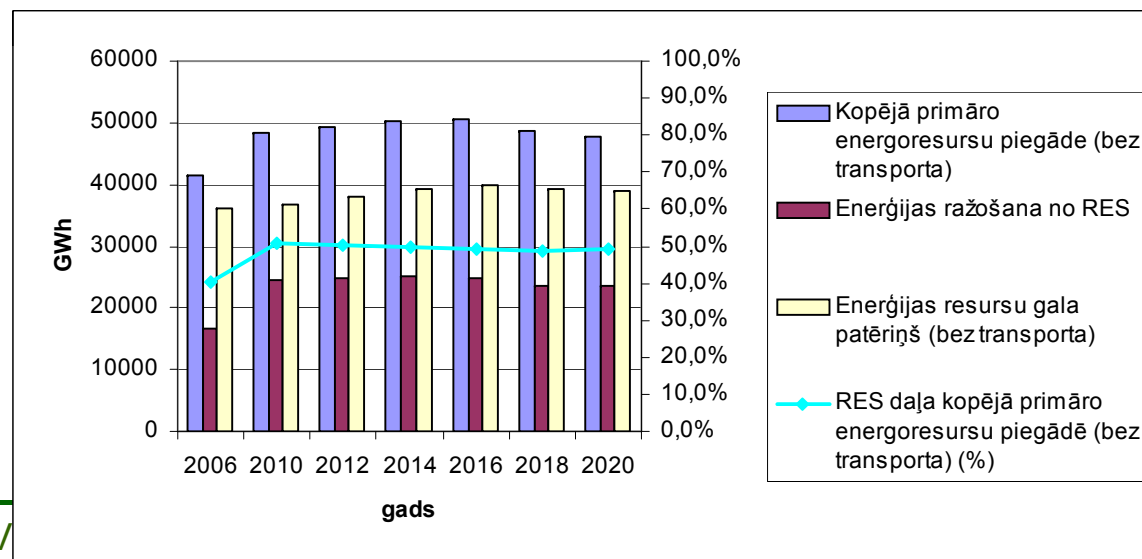
- Wood fuel for CHP in large cities.
- Wood fuel for Riga TEC 1
- No new electricity capacities on fossil fuel
- Wind generators – installed capacity 1000 MWe
- All boiler houses are replacing fuel from natural gas to biofuel
- Solar energy are used – installed capacity up to 0,1 MW

AER īpatsvars – D scenārijs

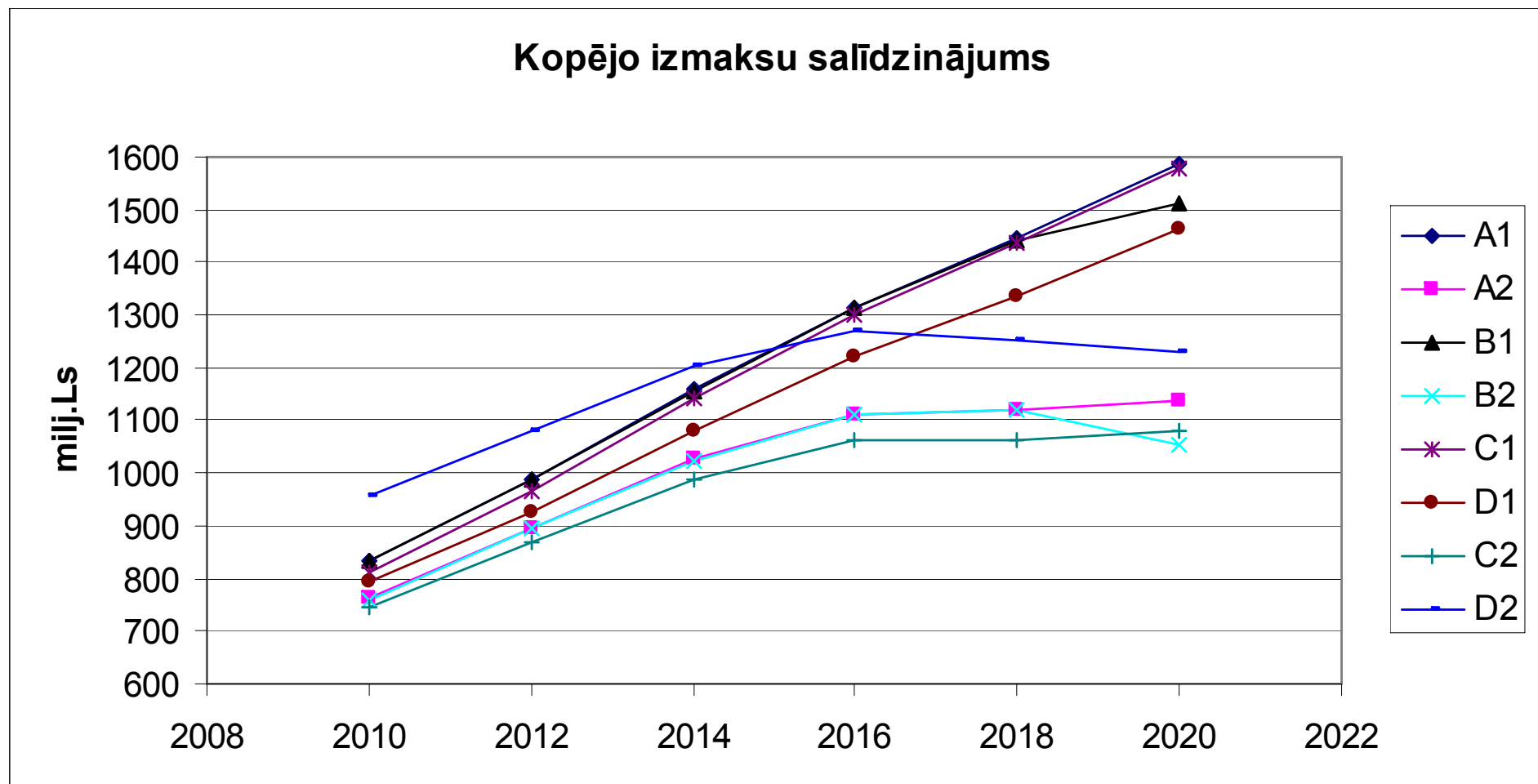
D1



D2



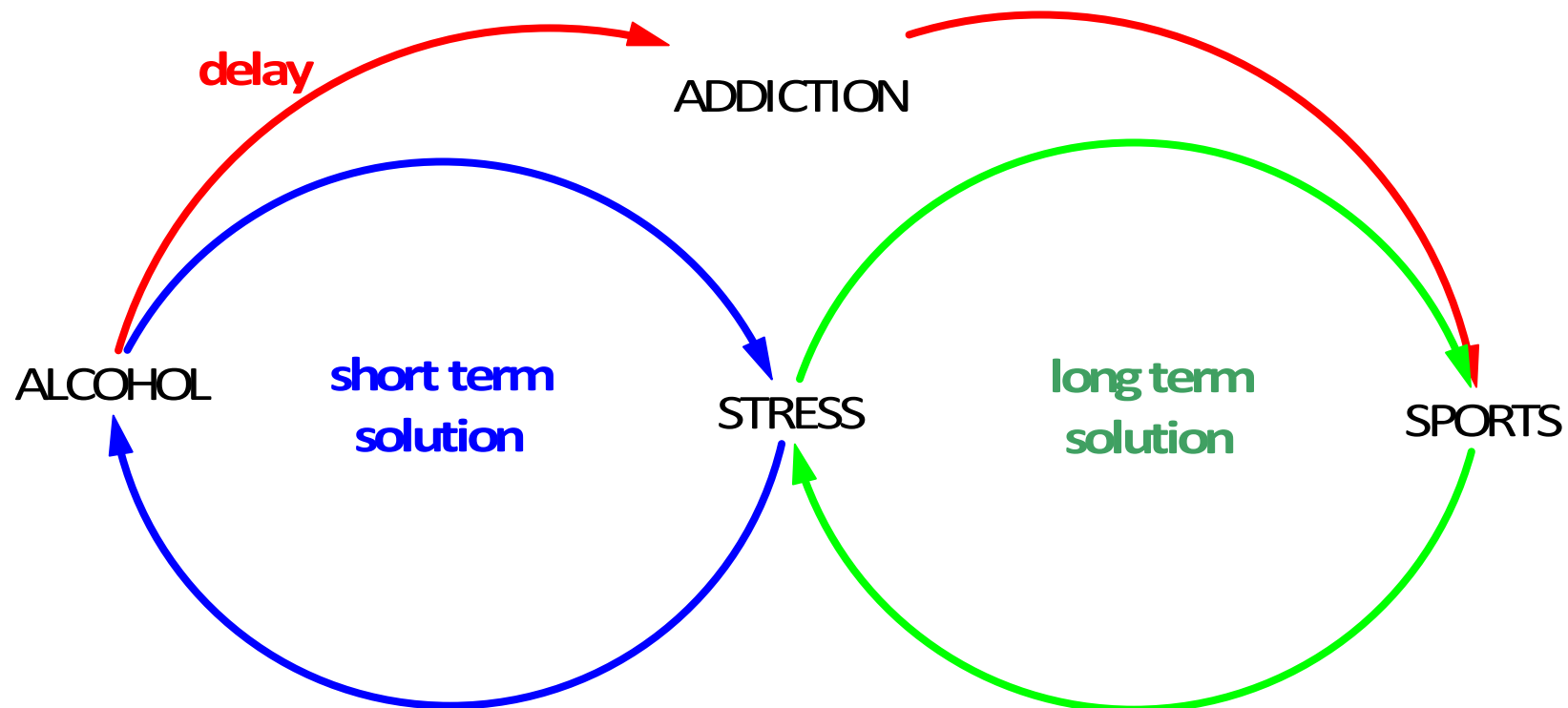
Total costs of scenarios

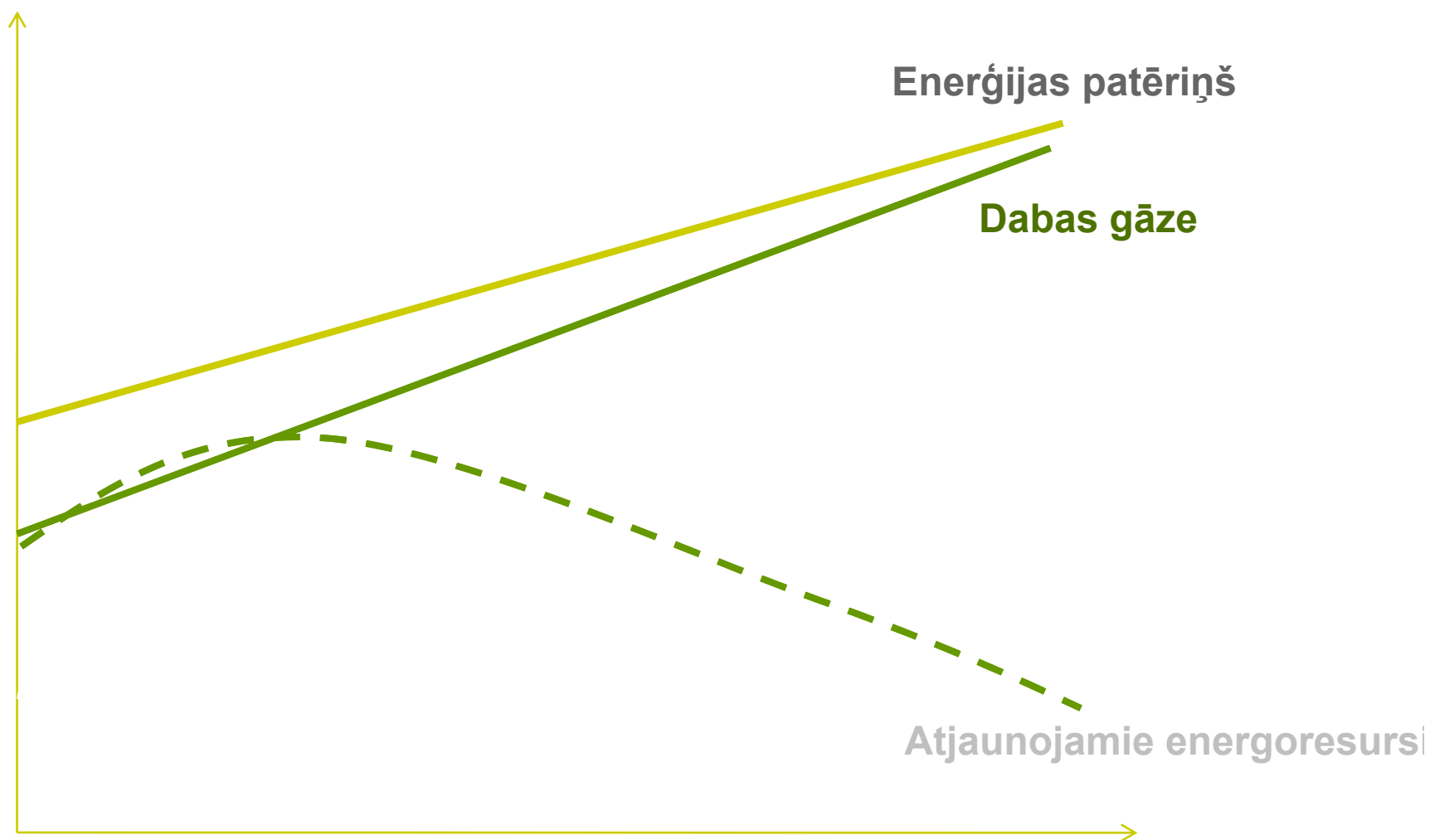


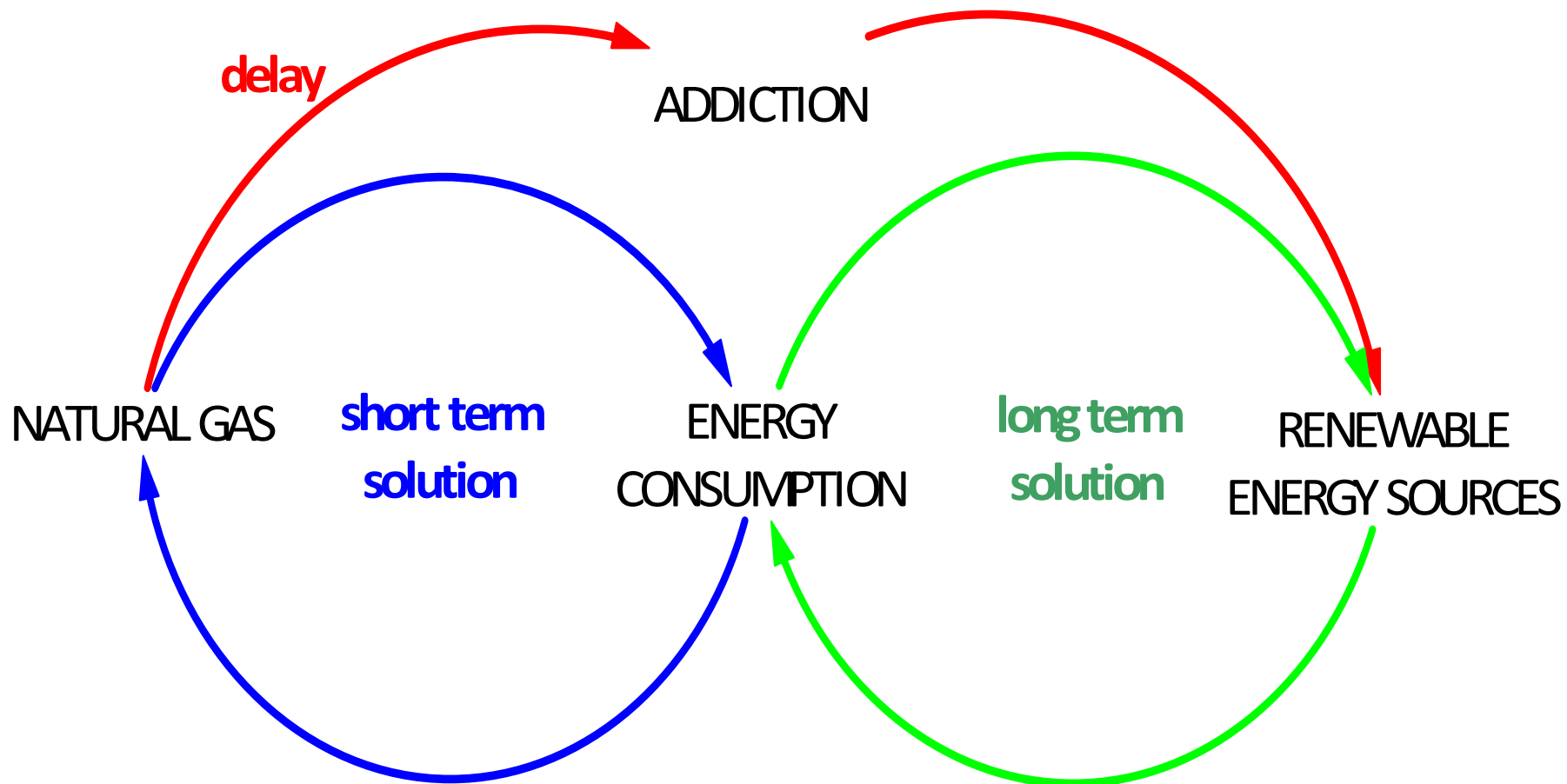
Some Economical and Socioeconomical Aspects

■ Biomass use

- New jobs 100 000 jobs/year
- Local fuel 10 Ls/MWh (natural gas 25 Ls/MWh)
- Development of local technologies - taxes 10 – 100 million Ls
- Less tariffs for energy
- Less import



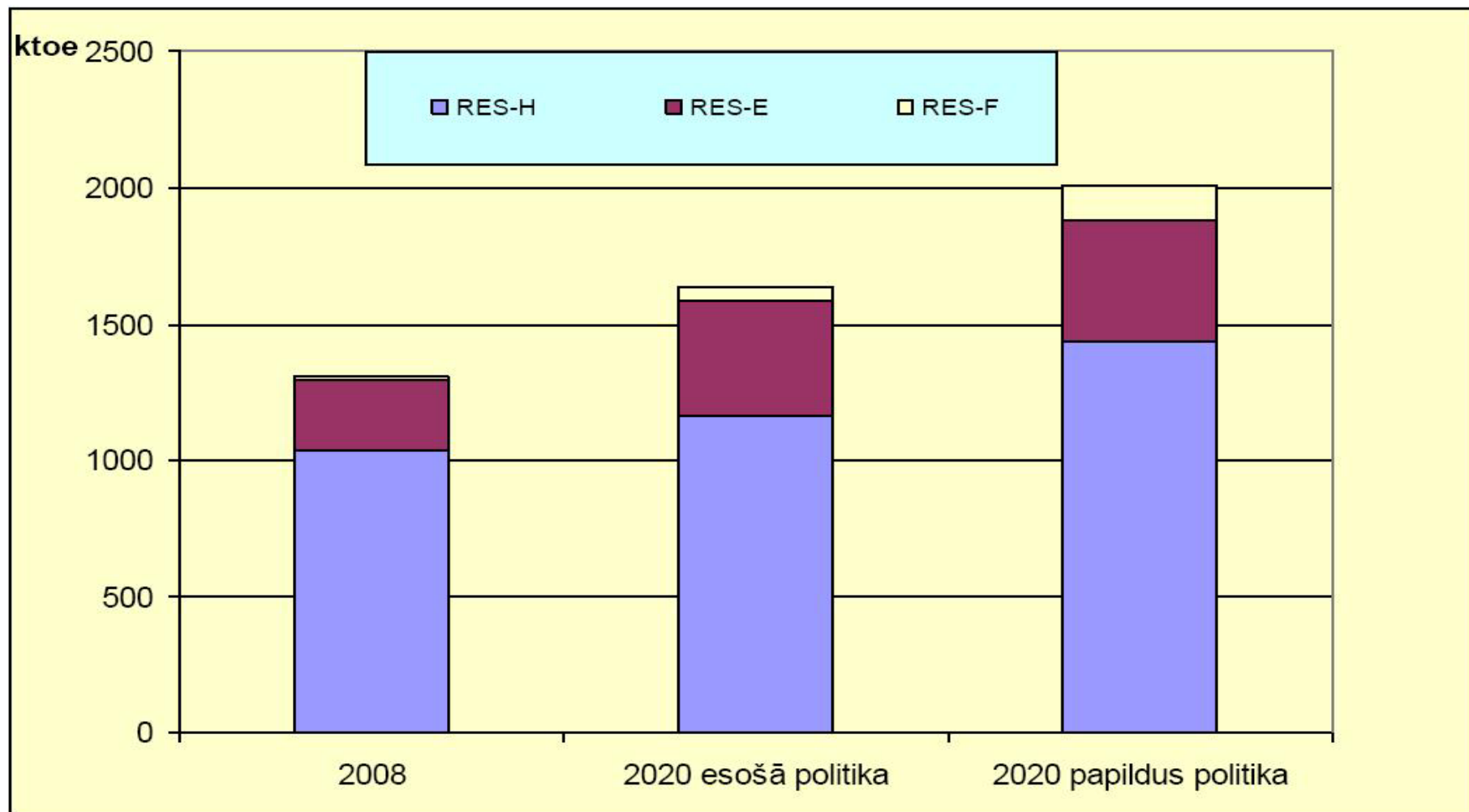




EU target possible is to reach if

- to change state **energy policy**
- to increase **energy efficiency**
- to increase share of
 - **biomass** in electricity and heat energy production
 - **wind** energy production
- to **support** only efficient renewable energy resources (no support for fossil fuel)
- to start **solar** energy use
- To renew small scale **hydropower** stations

Influence of RES Policy (info: Ministry of Economy December, 2009)



More information

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