



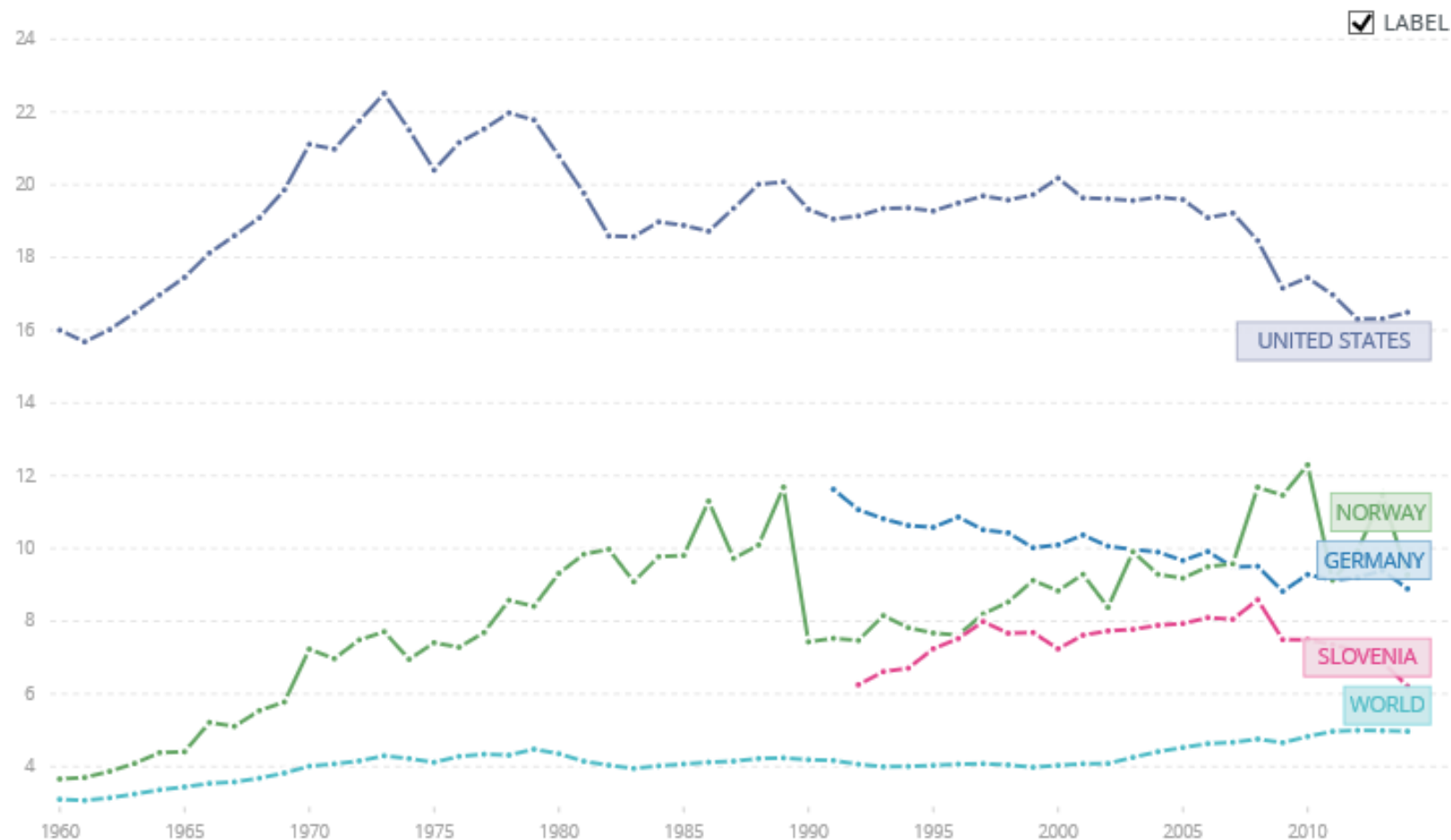
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# e-MOTICON

Electrification of the transport –  
Electric Power System perspective

*March 26st 2019, Milano*

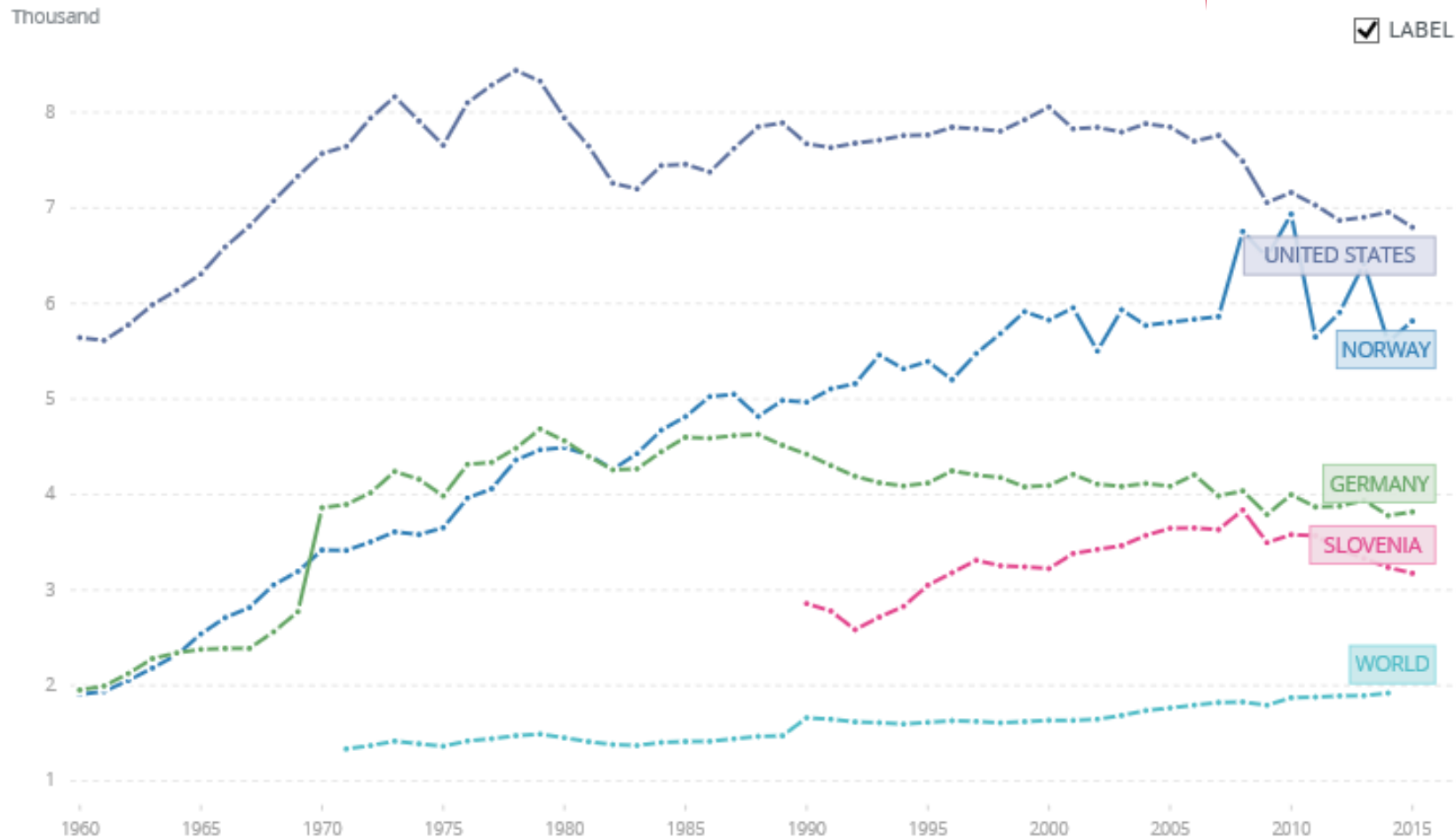
# CO<sub>2</sub> Emissions per capita (source: World Bank)



In tonnes

# Energy consumption per capita (source: World Bank)

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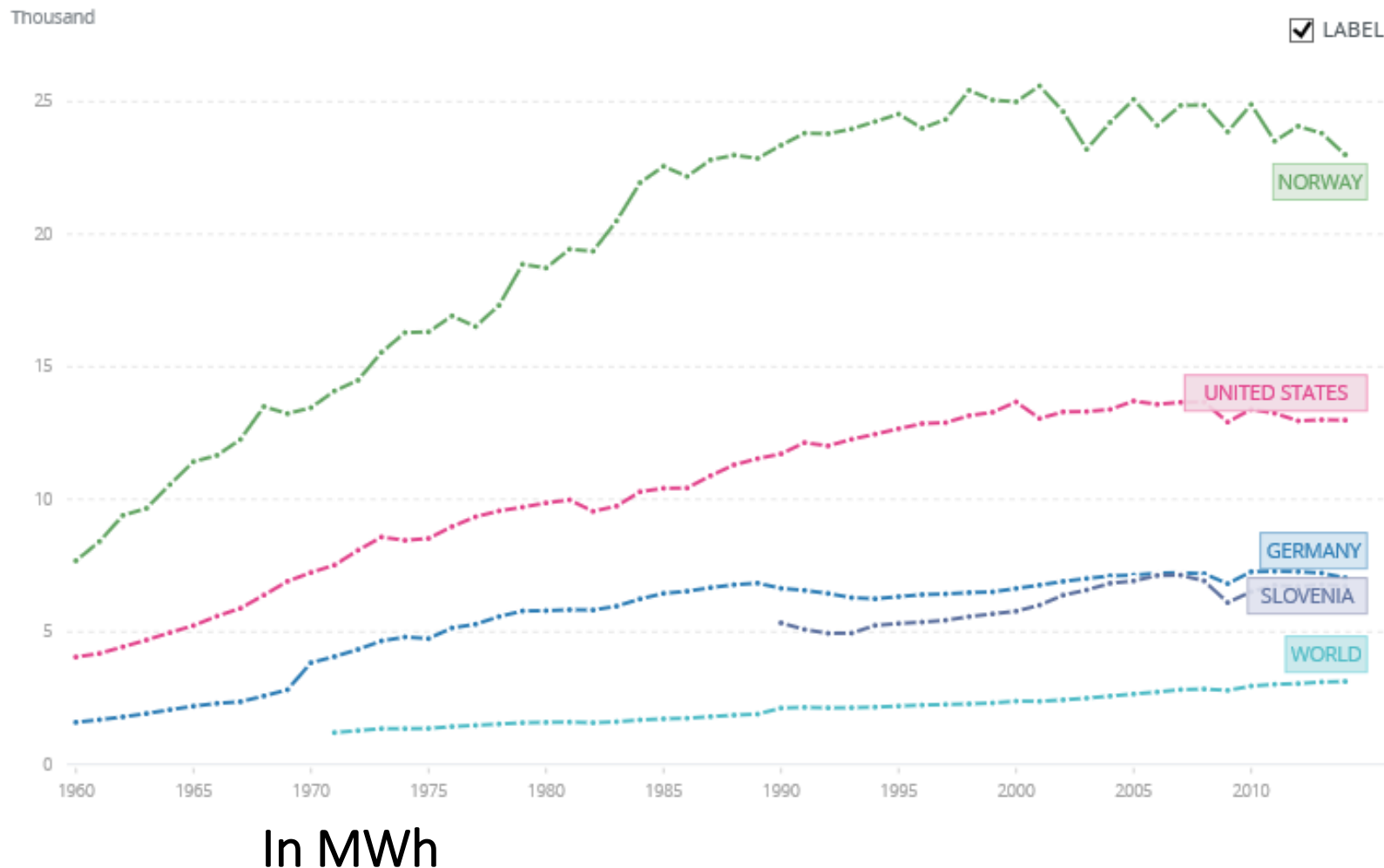


In tonnes of oil equivalent

# Electricity consumption per capita (source: World Bank)



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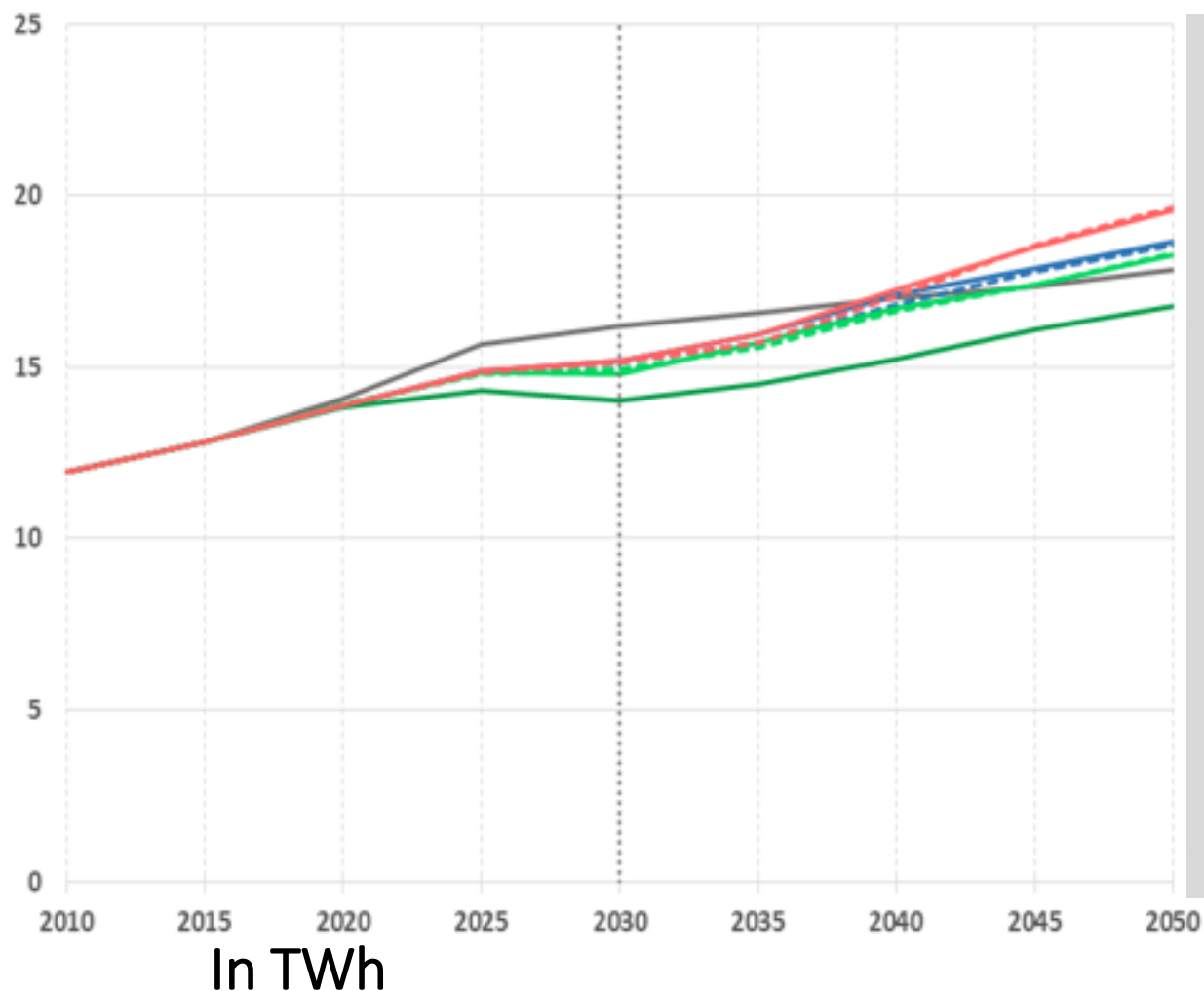


- Modern society will need more and more energy for its prosperity
- It is possible to be environment friendly with high energy demand

# National energy development plan (source: SLO Gov.)

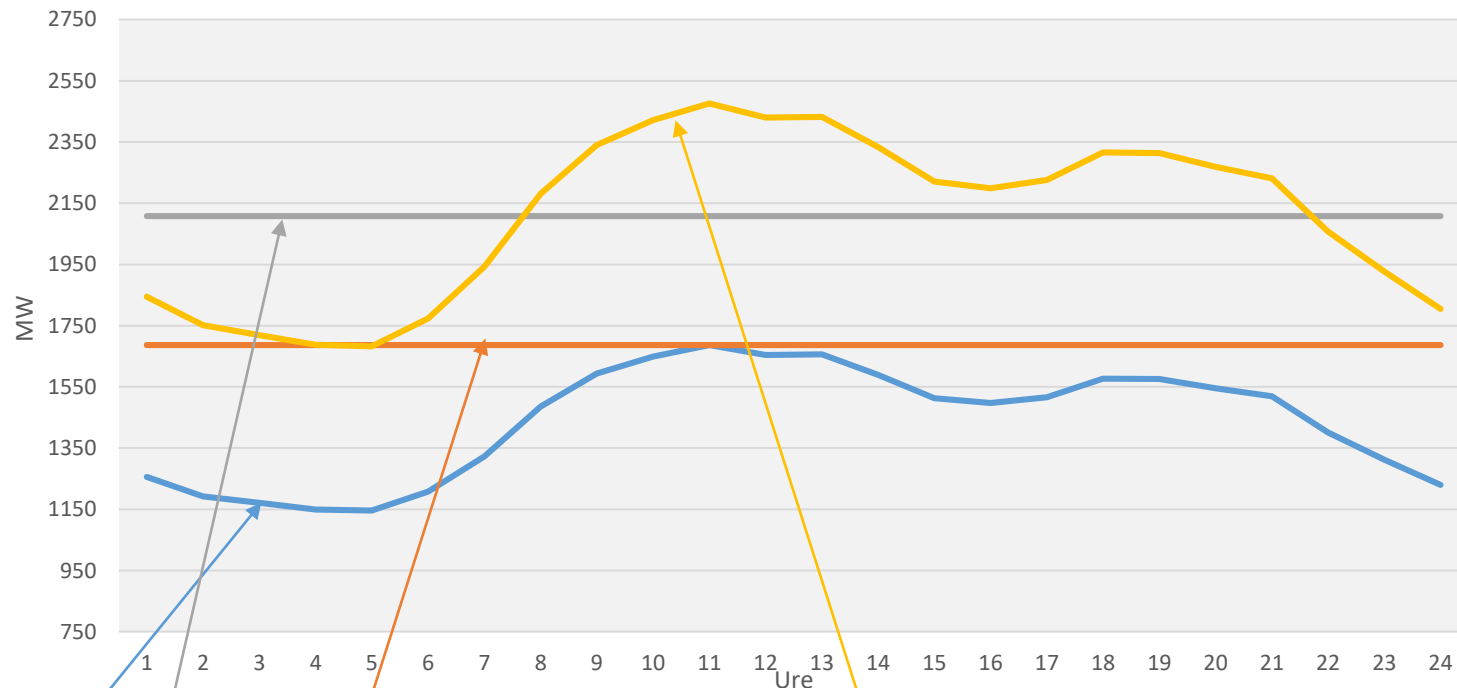
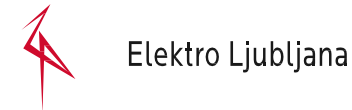


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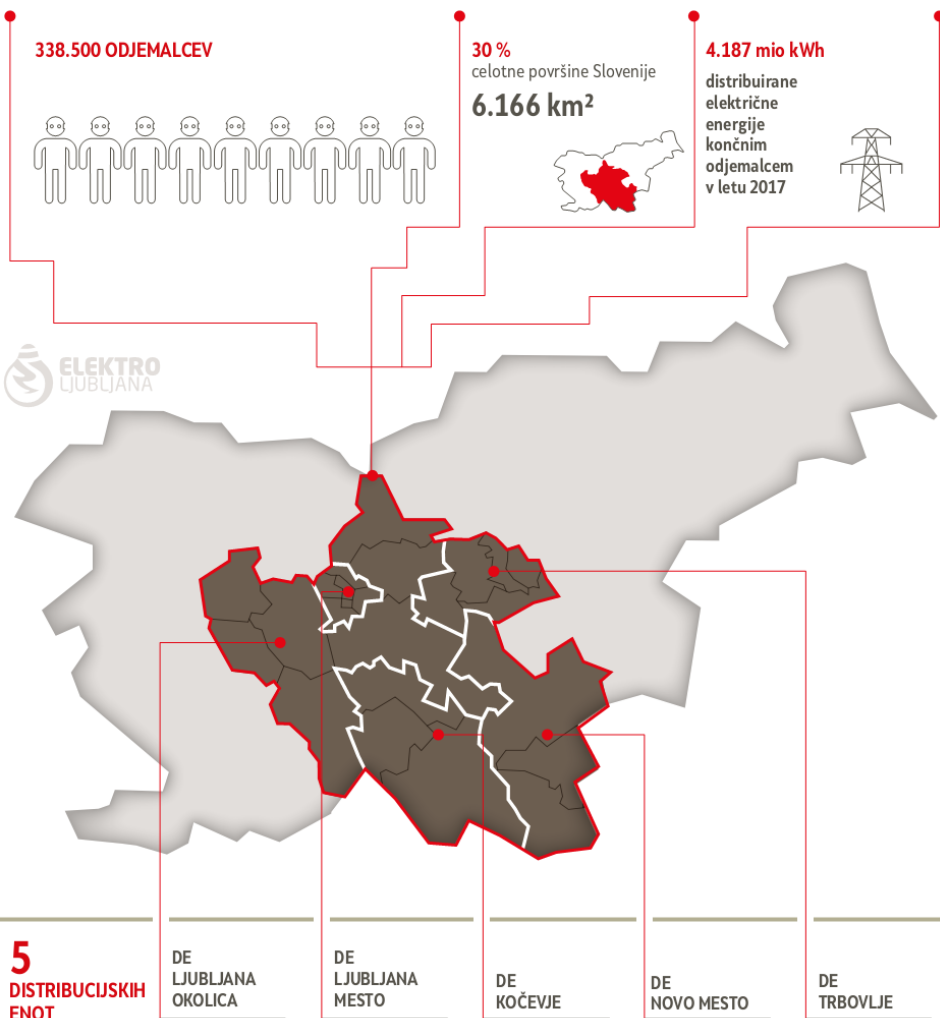
- **Planned consumption increase over 60% in the next 30 years**
- **About 4 TWh (65%) of increase is for transportation only**
- **Condition for decarbonisation is transport electrification**
- **Transportation will be essential part of electricity consumption**
- **We need additional 7 TWh of renewable energy!?**

# Needed relative network power increase (source: ELES)



- Today's load curve (cca 12,4 TWh / year)
  - Ideal today's network capacity (cca 14,7 TWh)
  - Expected ideal capacity and expected real capacity in 2050 (cca 18,5 TWh)
- Over 40% of power network capacity increase is needed!**

# Elektro Ljubljana – distribution utility



- 720 MW, cca 17.000 km of lines, cca 9.000 power transformers, biggest EV charging network in SLO
- To keep it running 24/7, 1,5 km of lines, 1 transformer and 80 energy meters need to be exchanged every day
- 70% more investment is needed in next 30 years
- 75% of costs of charging station is on the network



## Possible stimulation measures for e-mobility

- Risk on DSO side is much higher, than on charging infrastructure providers.
- **POTENTIAL FOUNDING SOURCES:** Increased network charges; More loans; National budget; Incentives for transport electrification.
- Incentives are already being paid and they should be directed into infrastructure (last for 30+ years) and not vehicles (6 years?).
- Subsidizing use of EVs through reduced network and energy charges instead of subsidizing purchase of EVs only.
- Electric and communication networks are biggest technical systems in the world and very optimized infrastructure (natural monopoly).
- They support markets of electricity and TC and same shall apply for charging infrastructure to get most effective results.



## Conclusions

- **We will use even more energy in the future**
- **Energy in the future will be electricity from renewable and partially decentralized sources**
- **We will have to increase essentially electric power network capacity and density to serve the needs**
- **Additional funds will be needed for renewable sources and power networks and incentives for transport electrification seems to be an ideal source**
- **Charging infrastructure shall be part of electric power system infrastructure**