



Introducing innovative technologies in the field of RES

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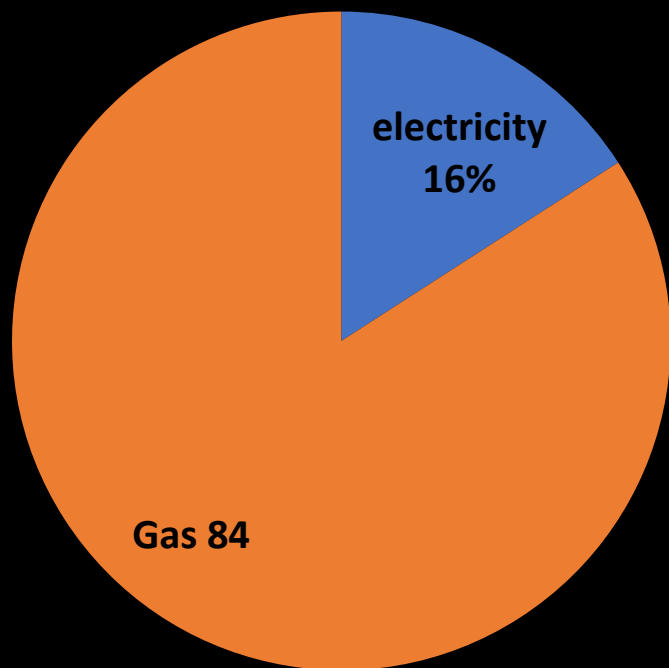
Energetic expert

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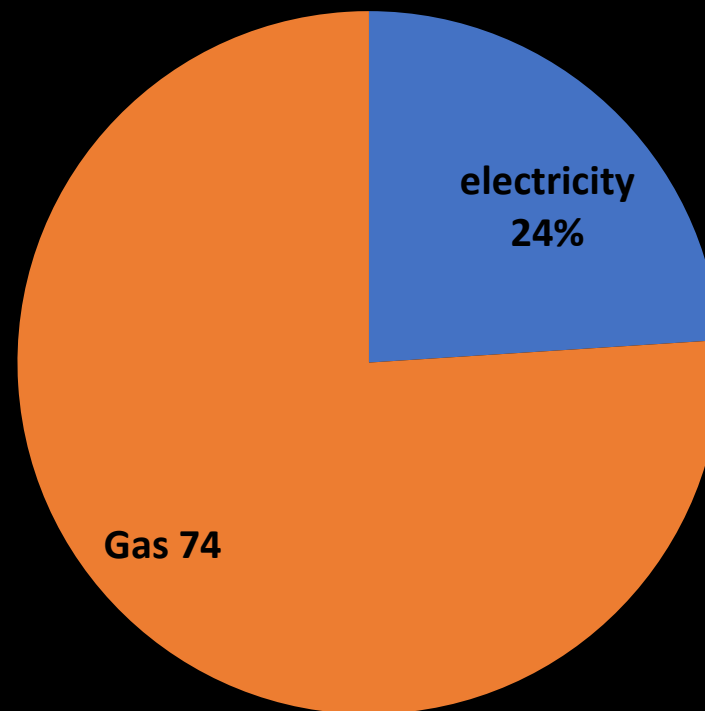
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Energy consumption vs. CO2 emissions If heat were only from gas



■ Elektrina
■ Plyn

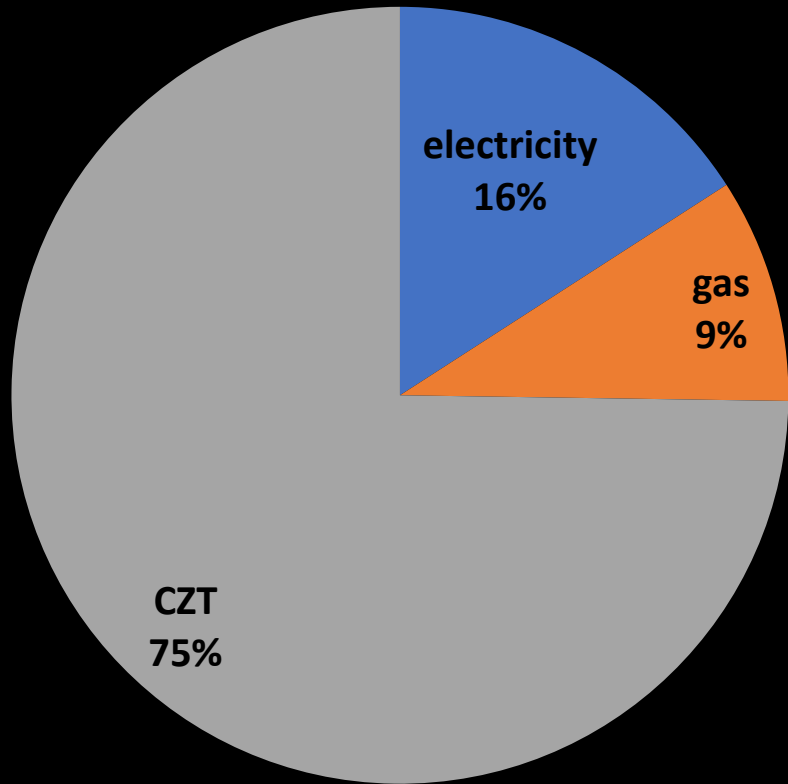


■ Elektrina
■ Plyn

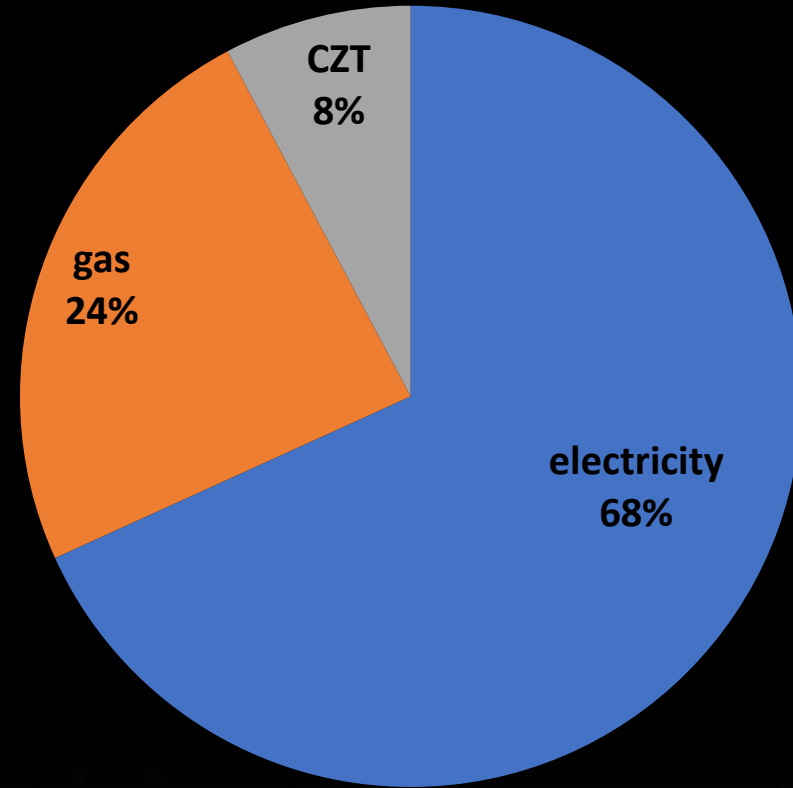
Energy = 54 GWh

CO₂ = 13023 t

Energy consumption vs. CO2 emissions vs. € fact

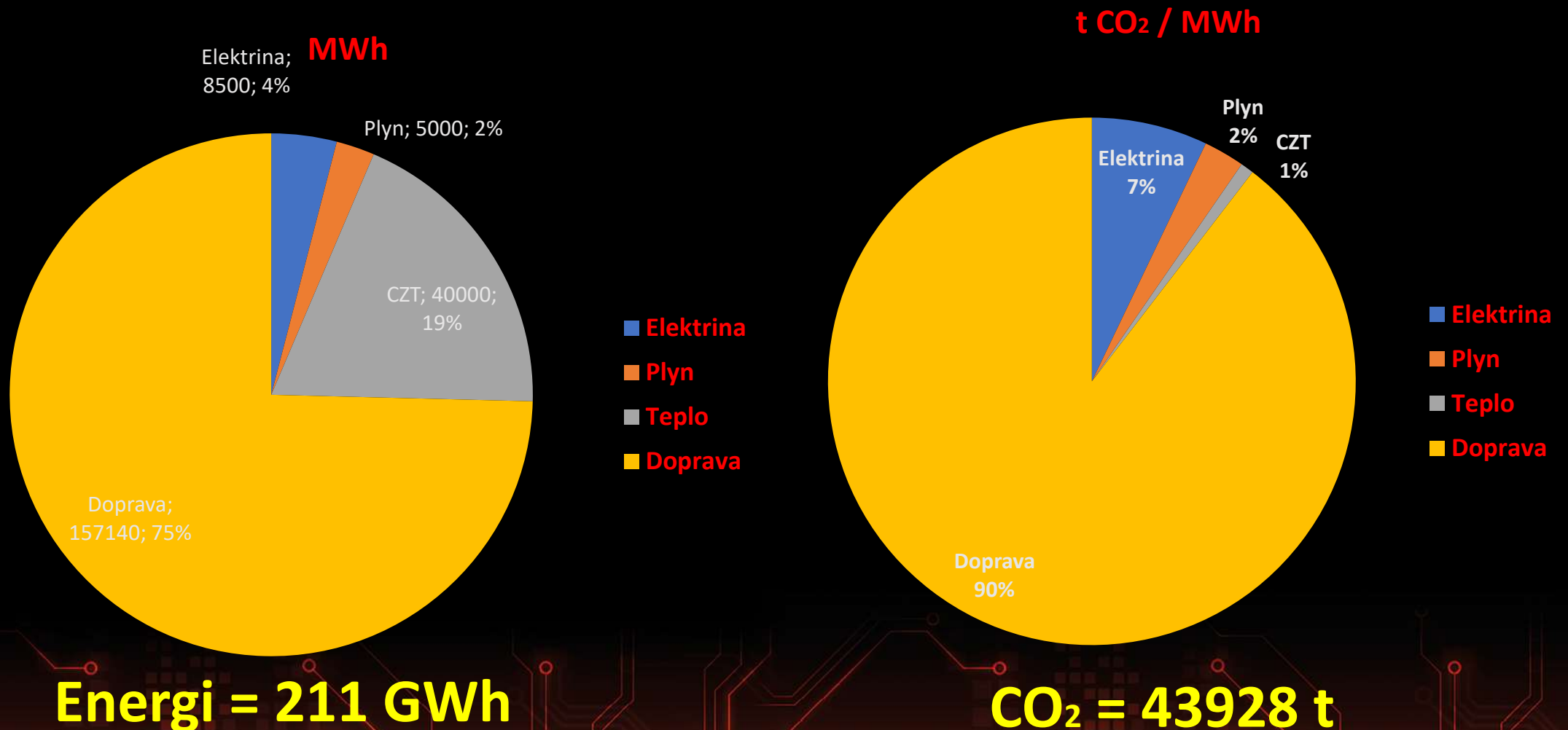


Energy = 54 GWh



CO₂ = 4578 t

Energy and CO2 balance with transport



Think globally...



Air transport



Emission footprint of Slovakia is 40 mil. t CO₂ (7.4 / pers)

The emission footprint of Germany is 885 mil. t CO₂ (10.8 / person) Approx. 1.2 million people are at any moment in the air

Almost 1 billion t of CO₂ emissions per year

For comparison:

Emission footprint of Slovakia is 40 mil. t CO₂ (7.4 / pers)

The emission footprint of Germany is 885 mil. t CO₂ (10.8 / person)

Ship transportation



52 000 cargo ships
Average cargo 50000 ton

Almost 2,5 mld. t CO2 yearly
1 cargo = 30 000 cars (in emissions CO2)

ELECTROMOBILITY

E-mobility = e-cars + e-chargers



E-mobility in Trnava city

- Public procurement of e-cars
 - NEDC range (obsolete, inaccurate)
 - WLTP range (realistic)
 - Car and battery warranty 5 years min
 - Free service and maintenance min 5 years
 - Availability of service 50km from TT
 - Crash tests
-
- Grant from Automotive association of industry
 - 5000€ for BEV (3000€ for PHEV)

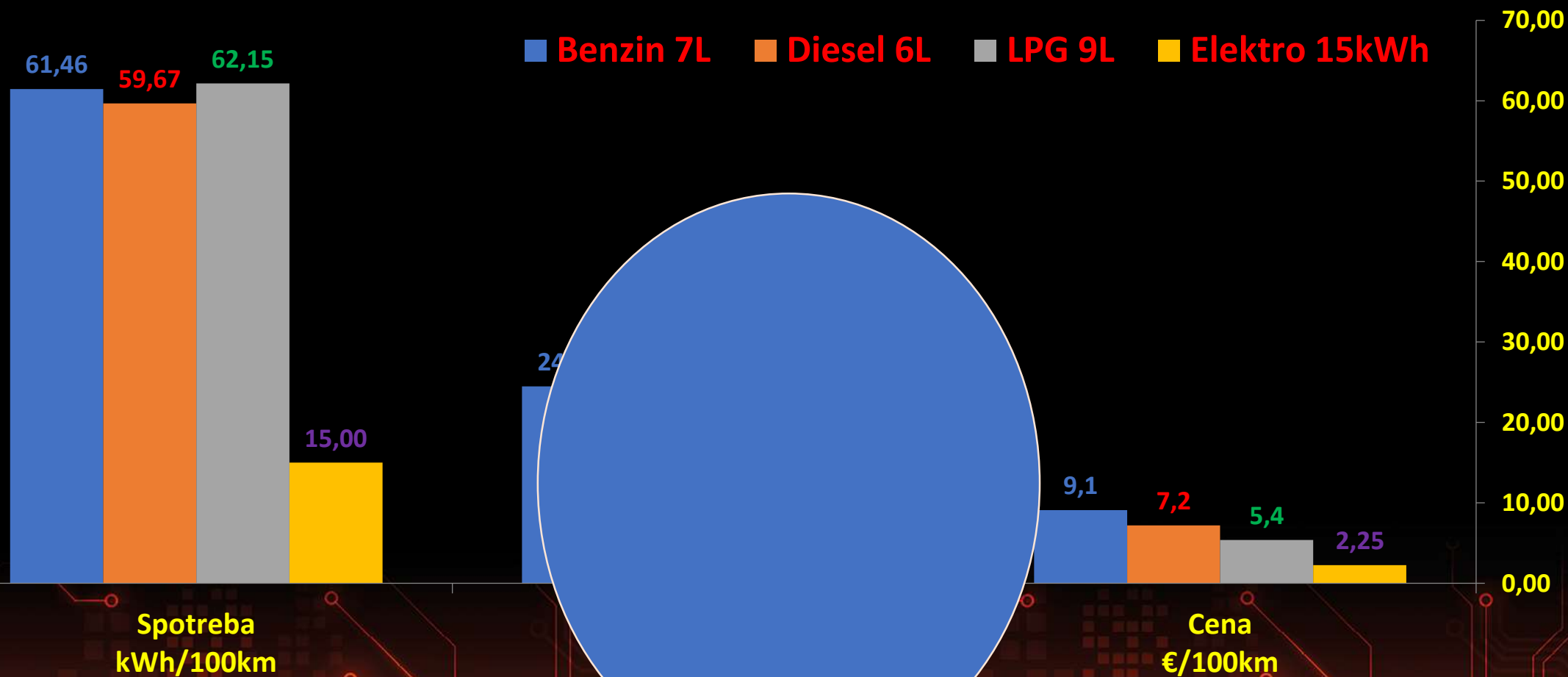
E-mobility in Trnava city

- Public procurement of e-chargers
 - Minimum technical requirements
 - Add requirements as a bonus
 - It could be more expansive by X EUR, if...
 - In the charging station is integrated payment terminal accepting payment cards chipless, contactless, with magnetic strip and printer block. **400€, 1x, B4=400€**

E-mobility in Trnava city

- Introduction of charging
 - Selected group free of charge
 - Another group free first 20kWh
 - Current price = electricity price x 2 (AC) x4 DC
 - City Price = Electricity + Overhead (x1,25-1,5?)
 - International Roaming - Hubject

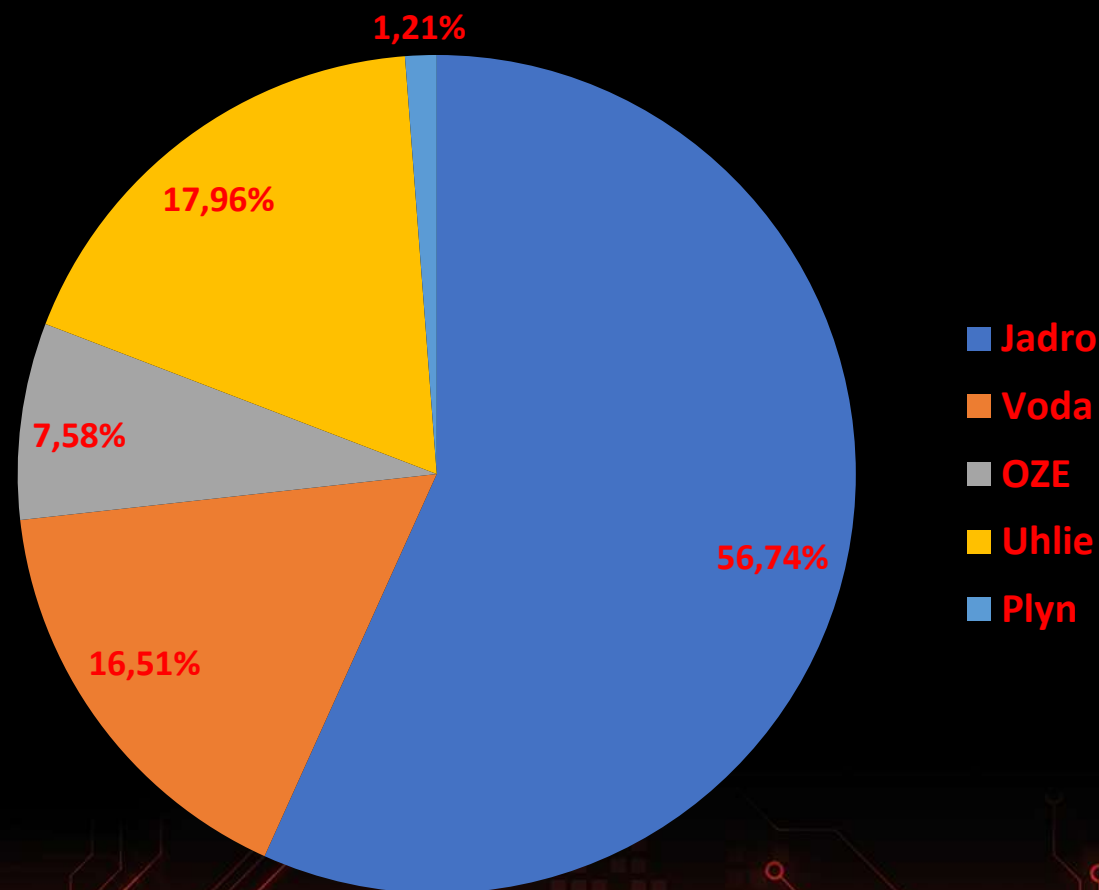
Electromobily vs. Other cars per 100 km



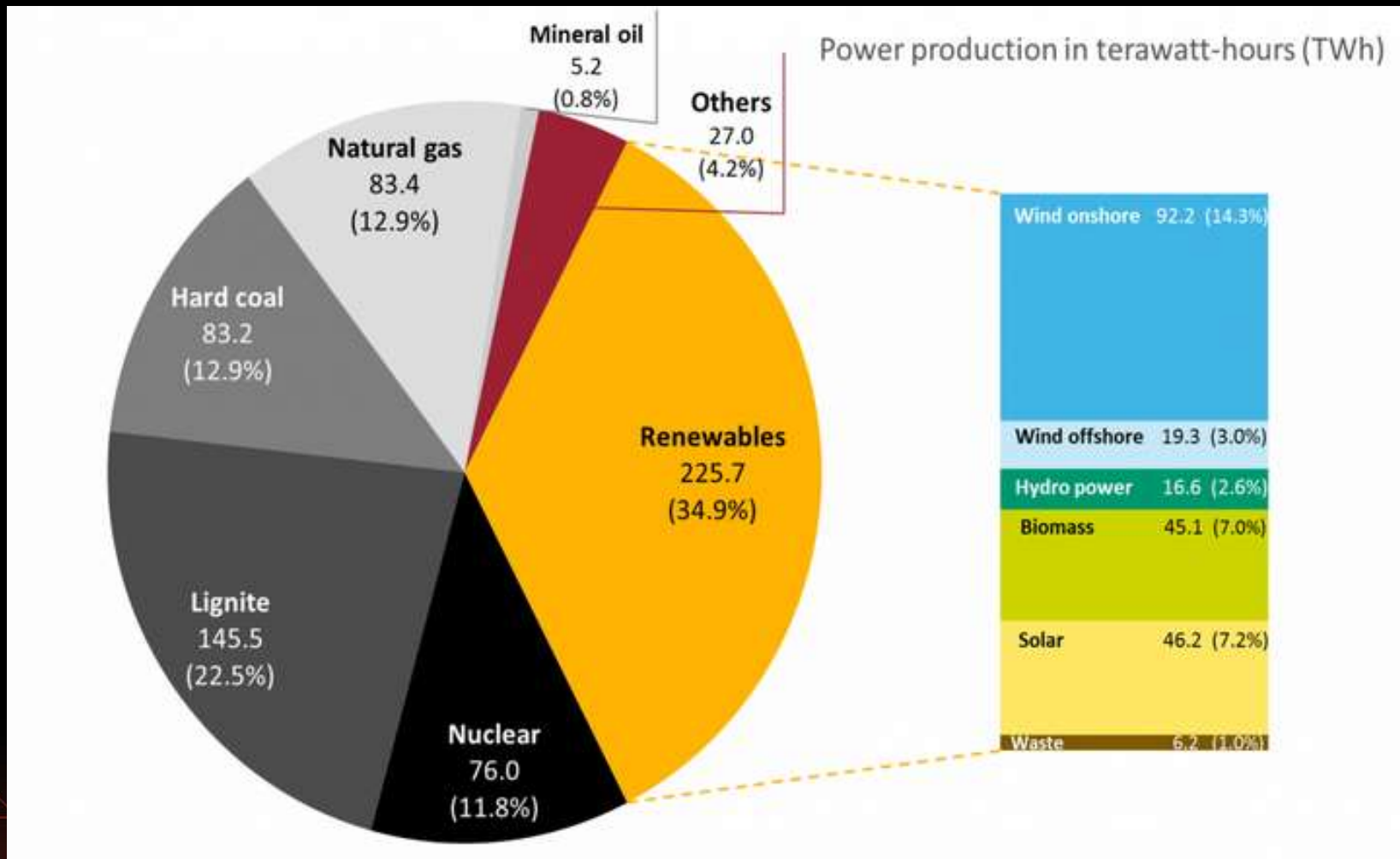
Electricity– energetic mix in Slovakia

- Core 56,74%
- Water 16,51%
- Coal 17,96%
- Gas 1,21%
- OZE 7,58%

- $FPE_{el} = 2,2$
- $EMf CO_2 = 0,167 \text{ t/MWh}$

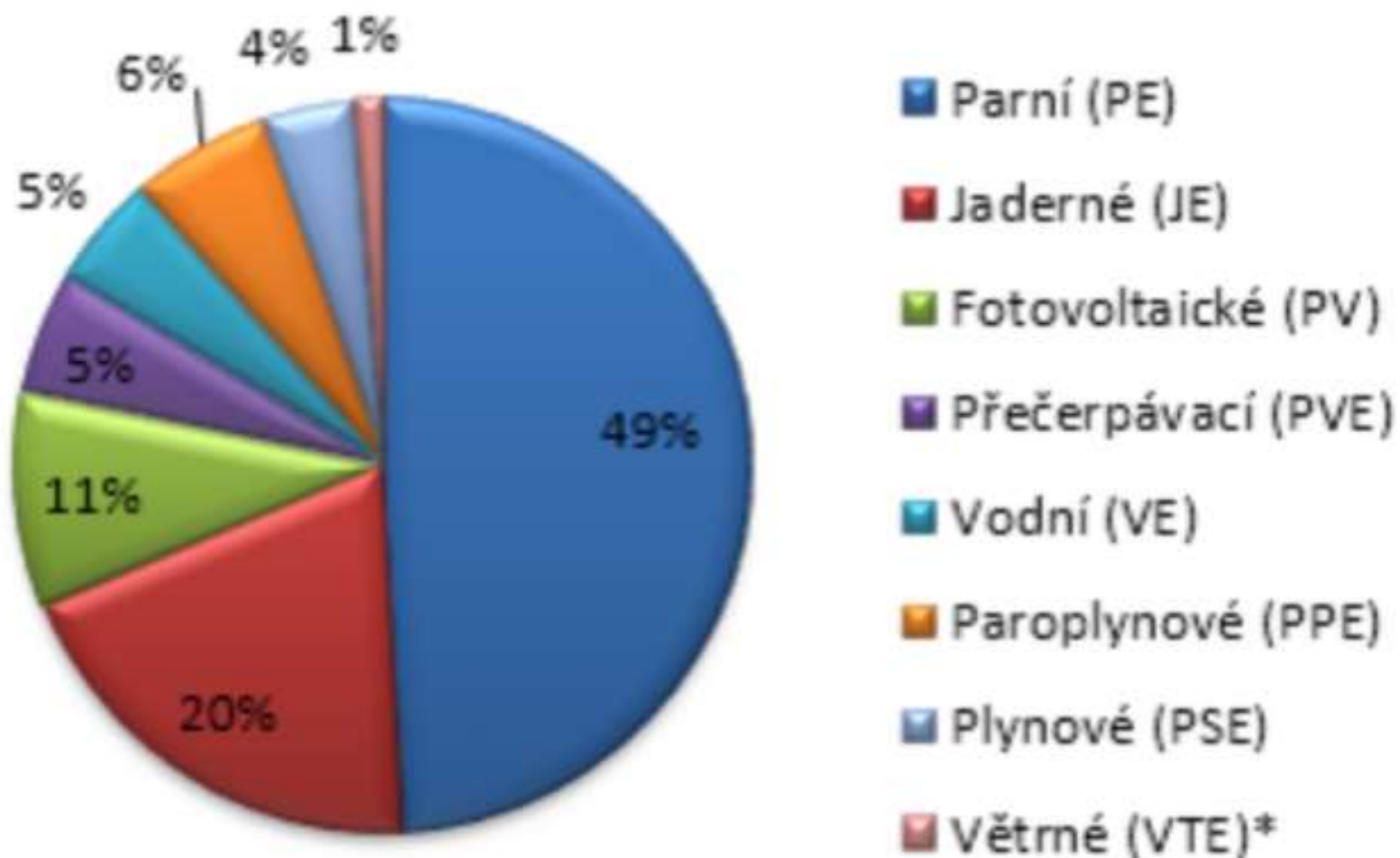


Electricity– energetic mix in Germany



EMf CO₂ = 0,6 t/MWh

Electricity – energetic mix in Czech



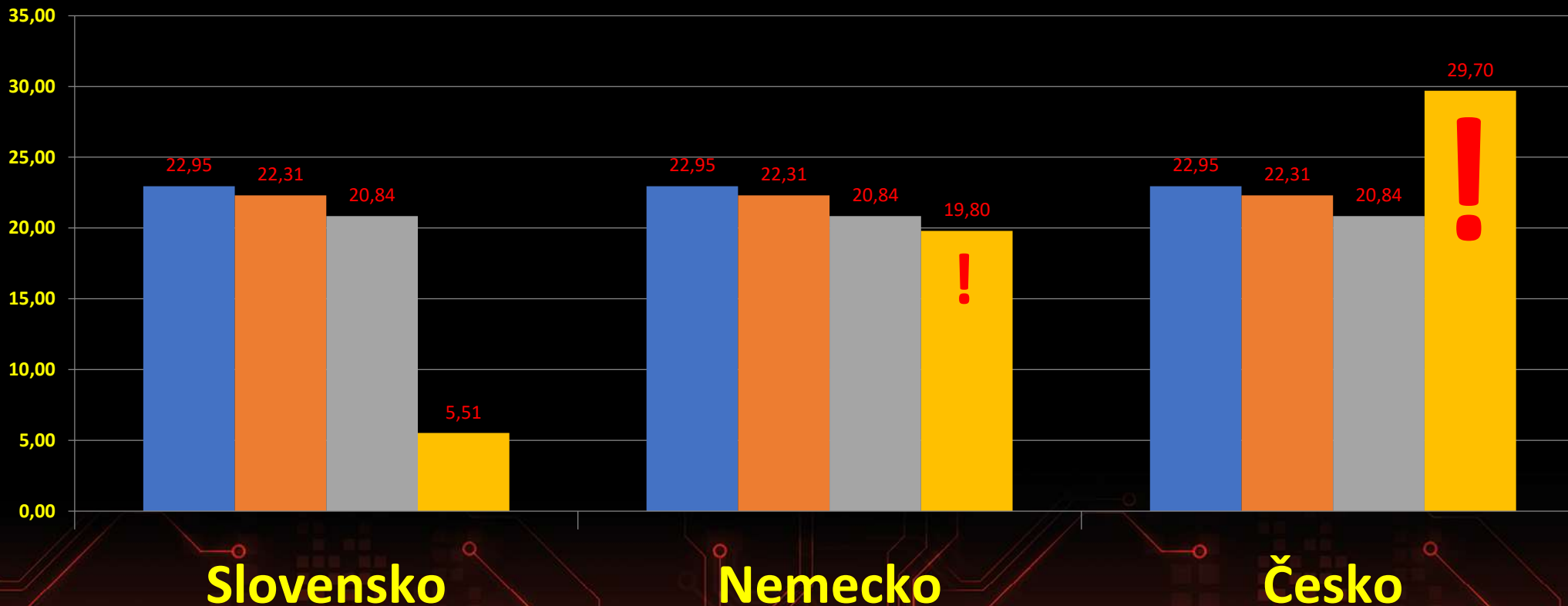
EMf CO₂ = 0,9 t/MWh

Sweden:

EMf = 0,023 t/MWh !!

CO2 emission/100km e-cars according to countries

■ Benzin 7L ■ Diesel 6L ■ LPG 9L ■ Elektro 15kWh



Photovoltaics

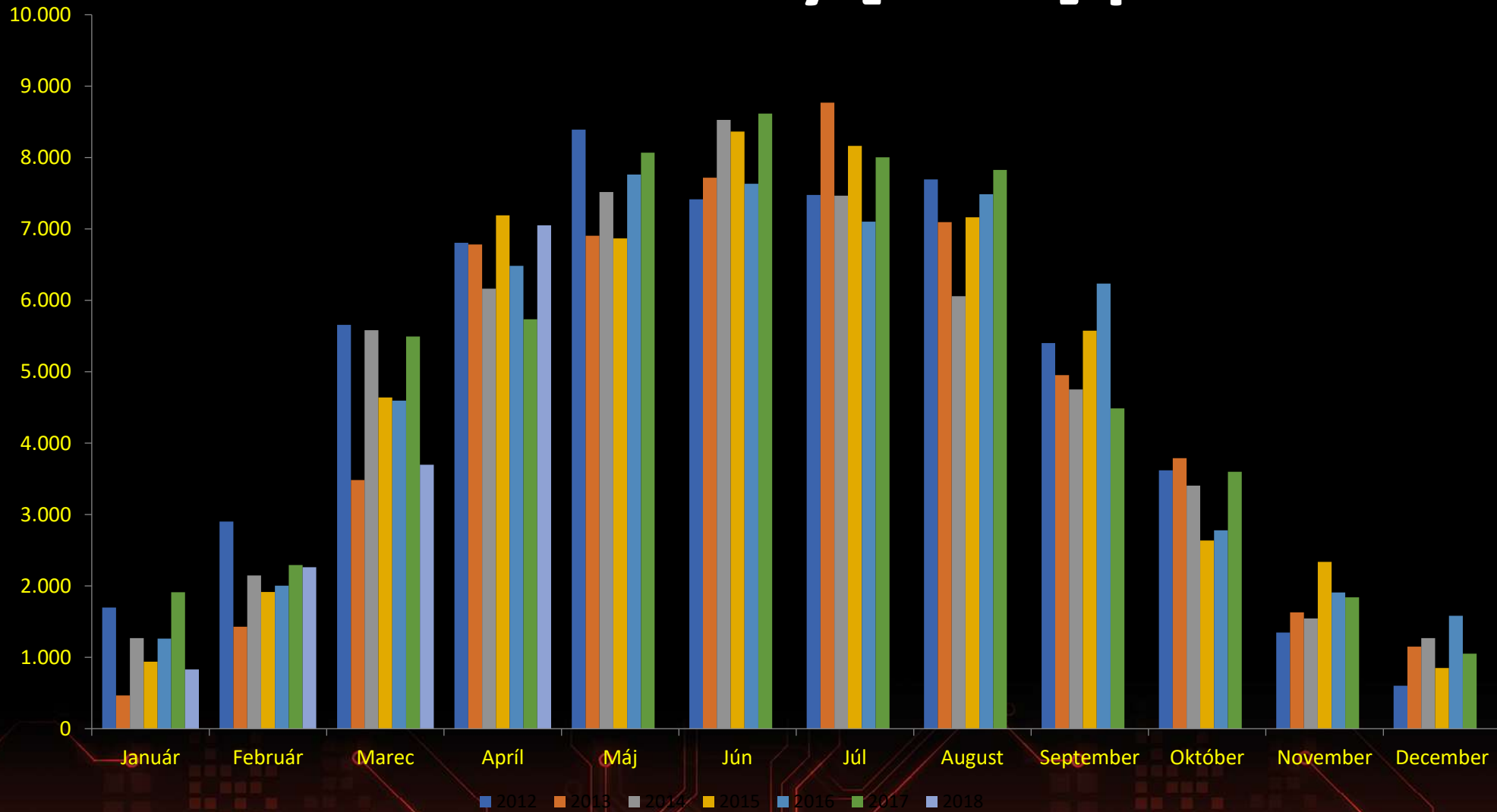


- Začiatok realizácie: august 2011
- Ukončenie realizácie: december 2011

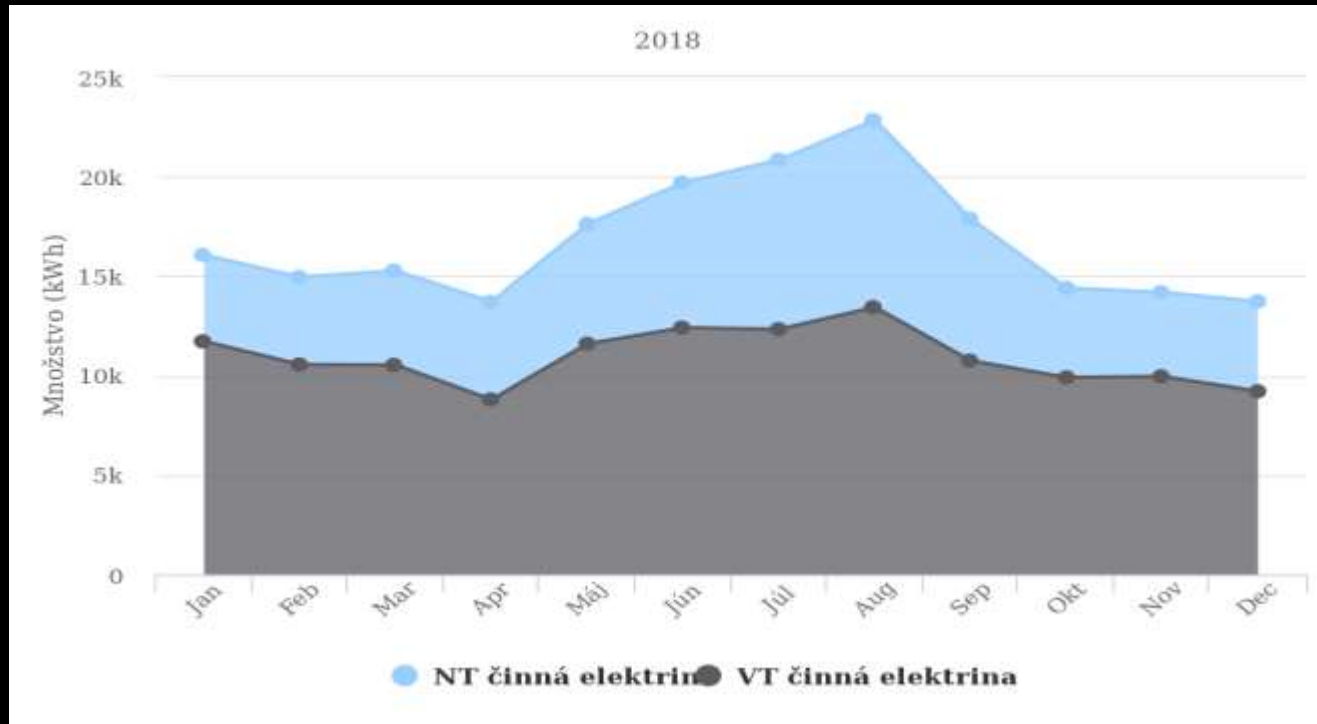


Fotovoltaické zariadenie

Production of electricity [kWh] per FVZ



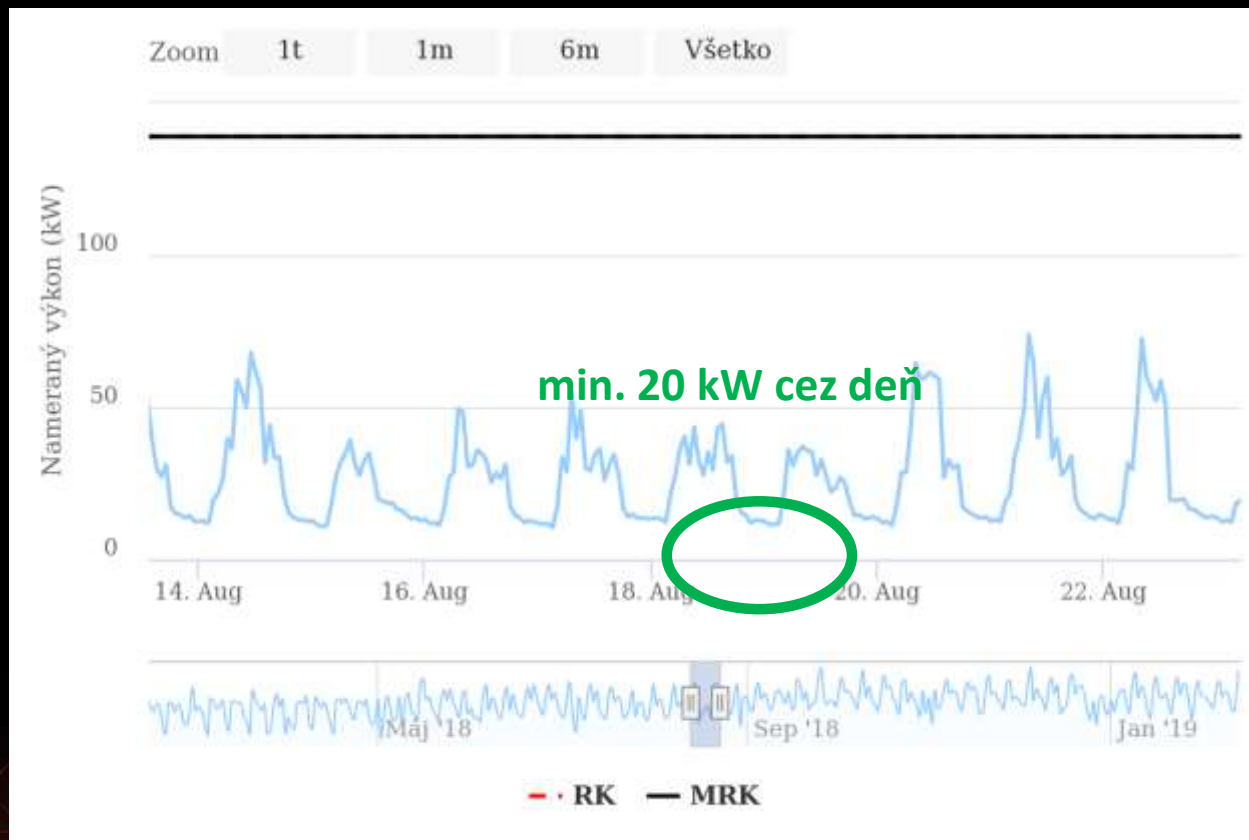
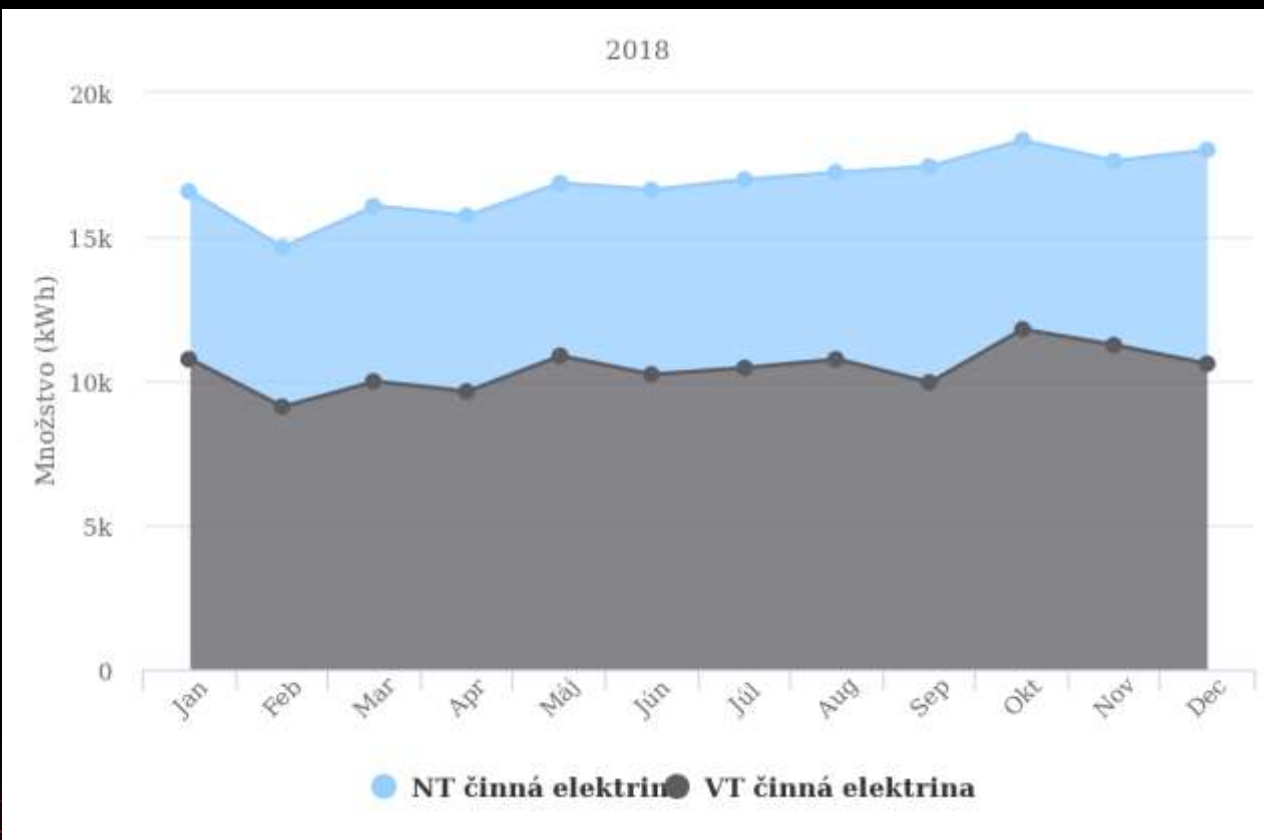
Course of electricity consumption MsU



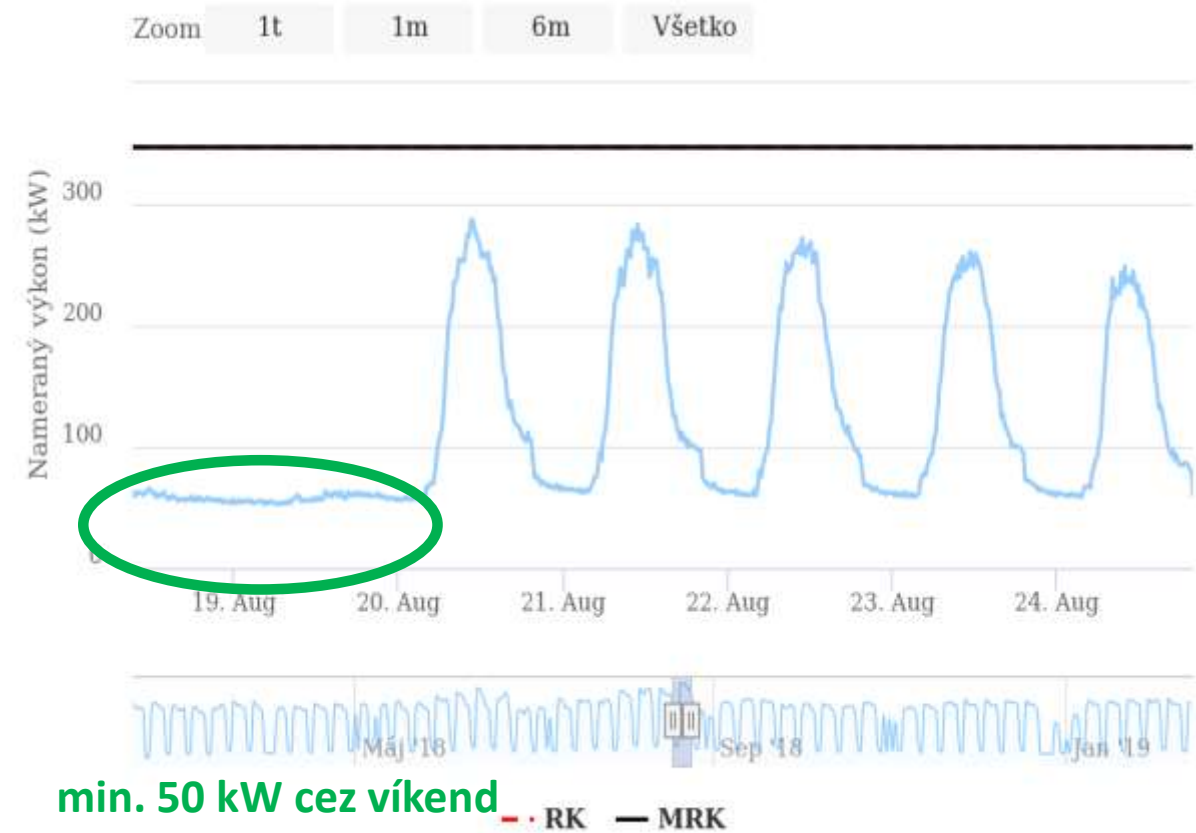
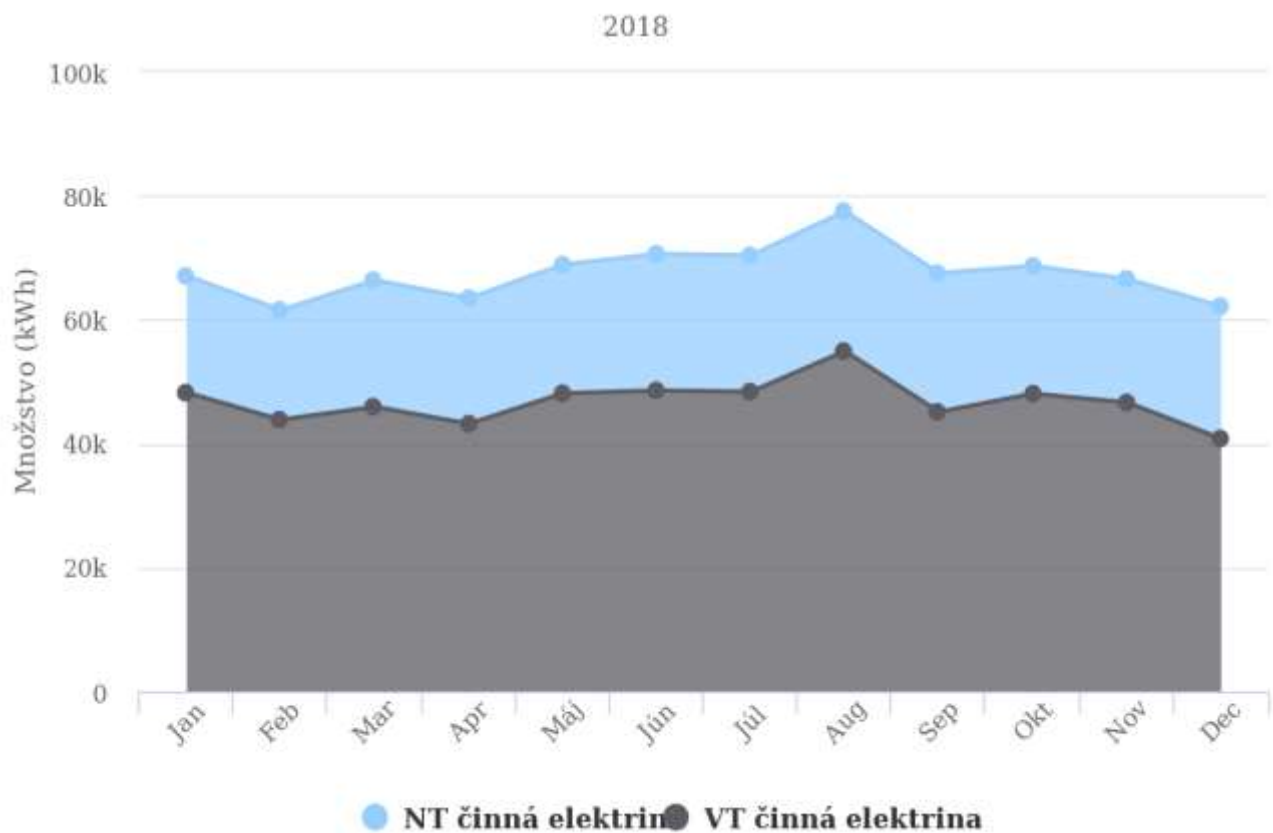
- + consumption copies production curves
- + minimum of basic collection
- Unsatisfactory statics



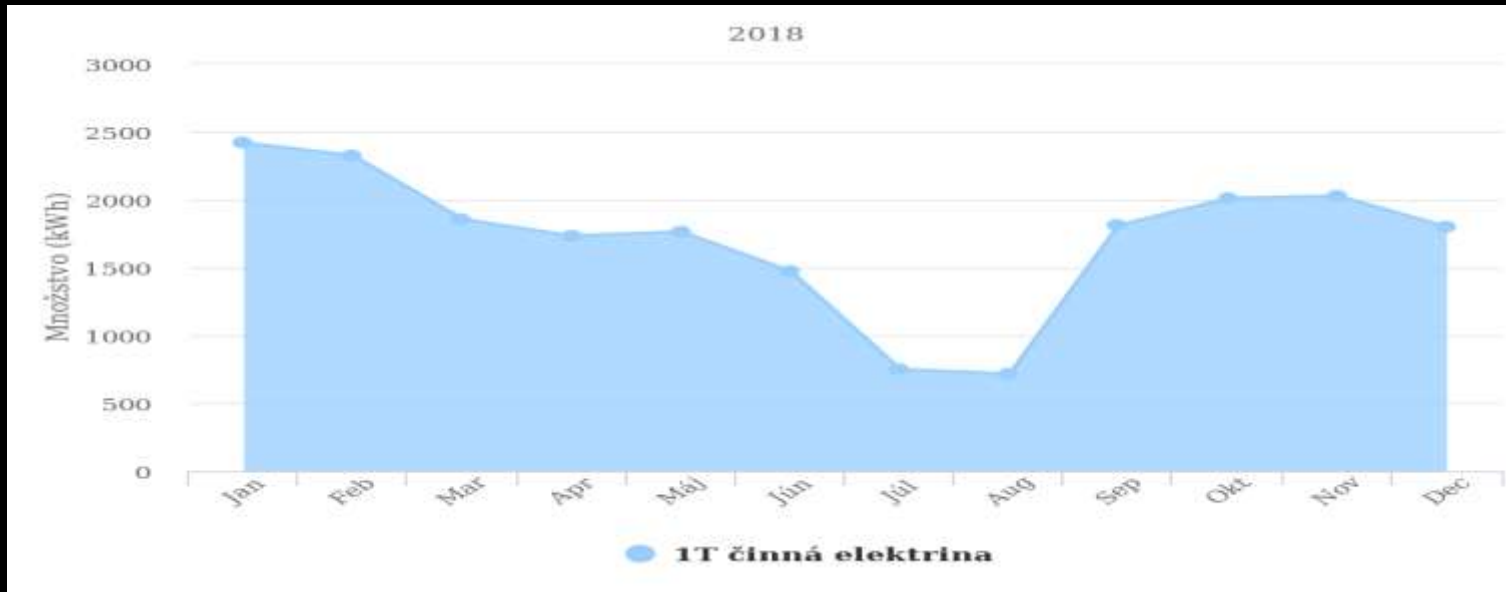
Appropriate buildings: Facilities for seniors



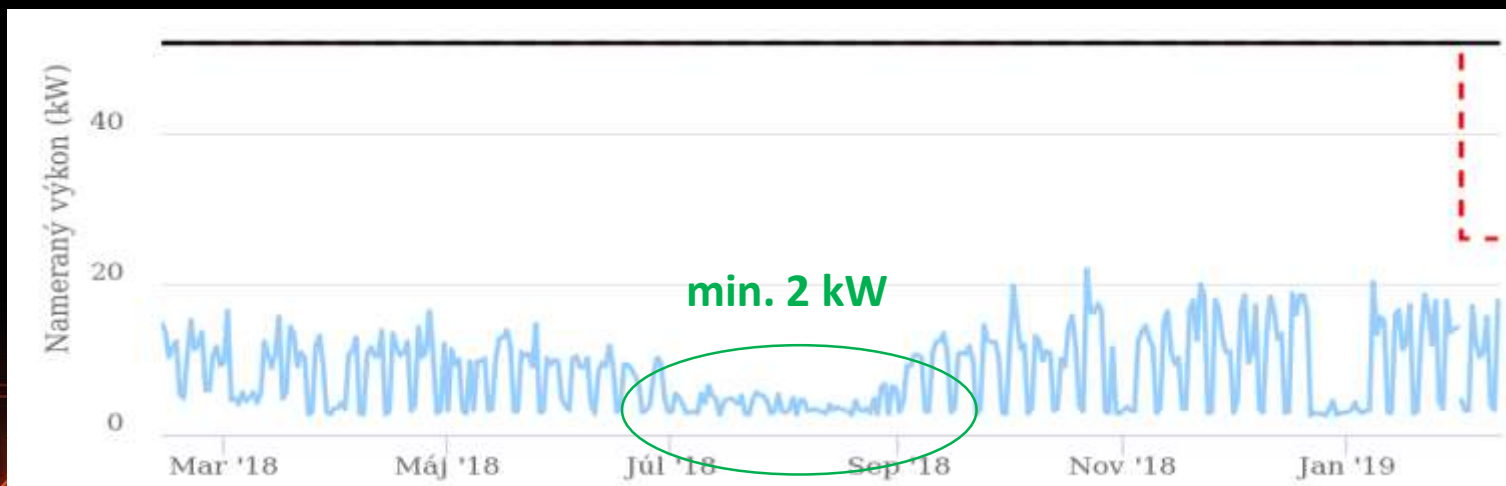
Appropriate building: Healthcare



Course of electricity consumption Basic school

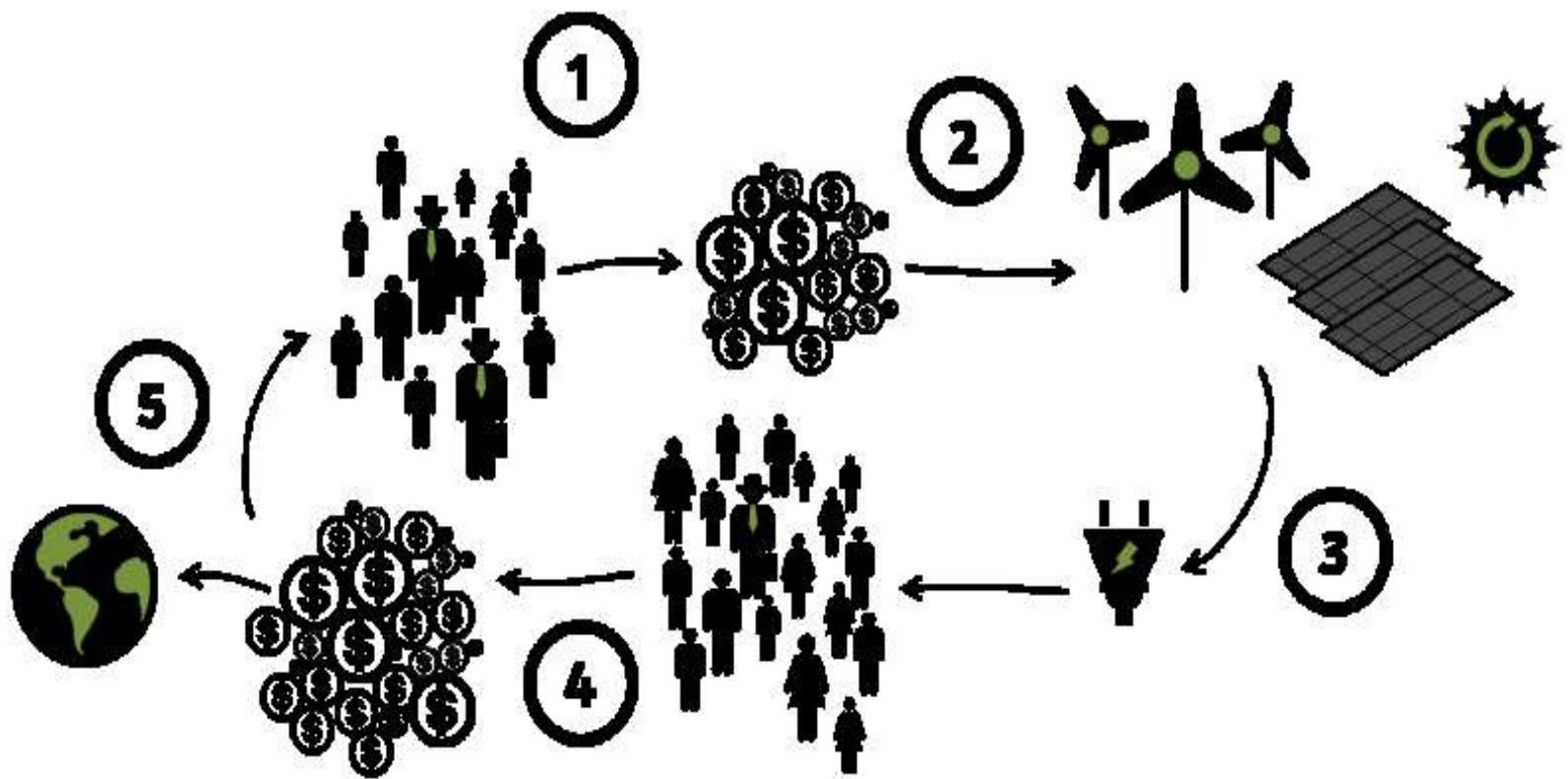


- Summer power outage
- Low basic consumption



Financing RES through crowdsourcing

renewable energy cooperatives

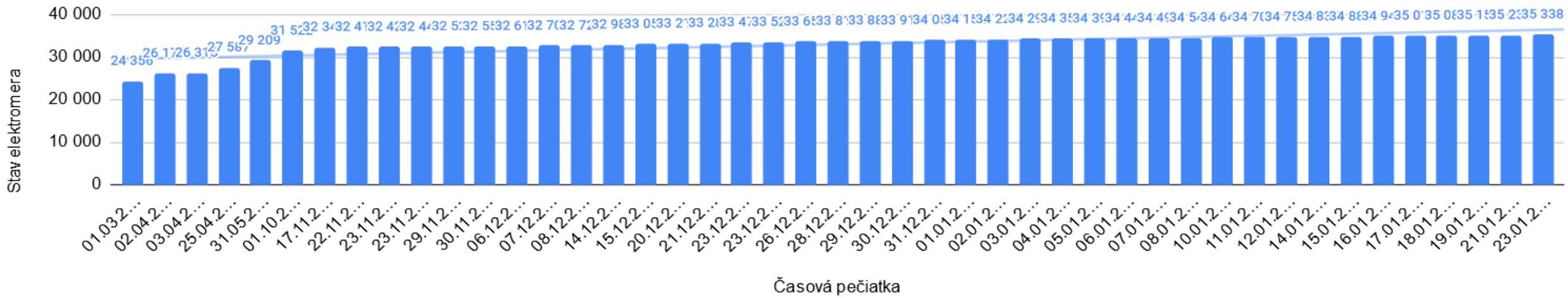


ENERGETIC MANAGEMENT

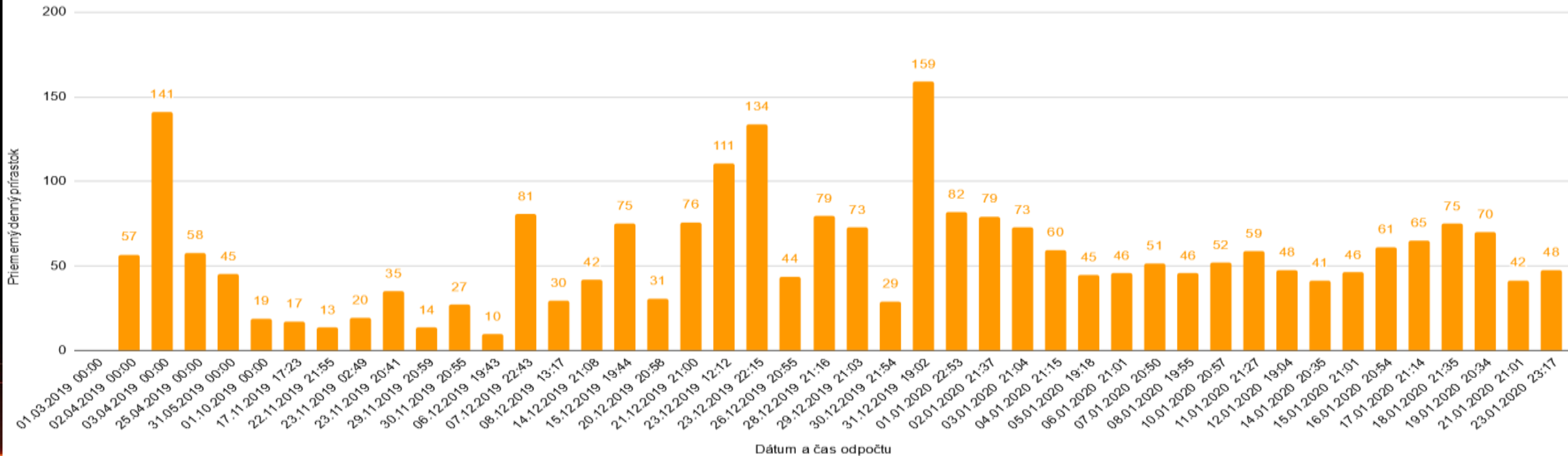
data collection

- Manual collection
 - + noticable
 - + cheap and easy to notice
 - - longer interval
- Automatical collection
 - + short interval
 - + perfect review
 - - expansive and complicated, it values only in industry

Stav elektromera



Priemerná denná spotreba



Need of energetic audits

- Benefit of audits

Recommend concrete steps

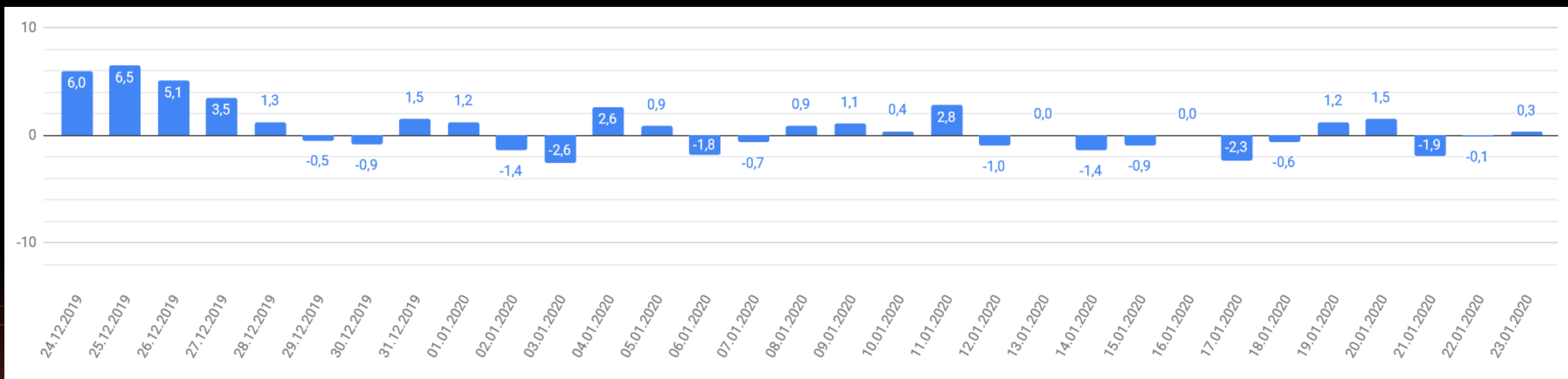
- estimate the cost and return of measures
- condition for participation in grant calls

Disadvantages of audits

- High price (1 building 2-5000 EUR)
- Too extensive, sometimes unnecessary details
- The auditor may not always know the latest technology

Thermal properties of buildings

- Calculation of the permeability of walls, windows, roofs, floors - energy audit level
- energy used difference in average temperatures of the day (standard 20st) and outside



Conclusion – financing of innovations

- No return - subsidies
audit needed
With return - EPC, crowdsourcing
Quick screening is enough, the exact numbers will be entered by the contestants

Conditions need to be created (renewable energy cooperative)



Thank you for your attention

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