

ENERGY SAVINGS POTENTIAL IN PUBLIC BUILDINGS IN SLOVAKIA

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Ministry of Economy of the Slovak Republic

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OPERAČNÝ PROGRAM
KONKURENCIESCHOPNOSŤ
A HOSPODÁRSKY RAST



EURÓPSKA ÚNIA
EURÓPSKY FOND REGIONÁLNEHO ROZVOJA
INVESTÍCIA DO VAŠEJ BUDÚCNOSTI



Research aim

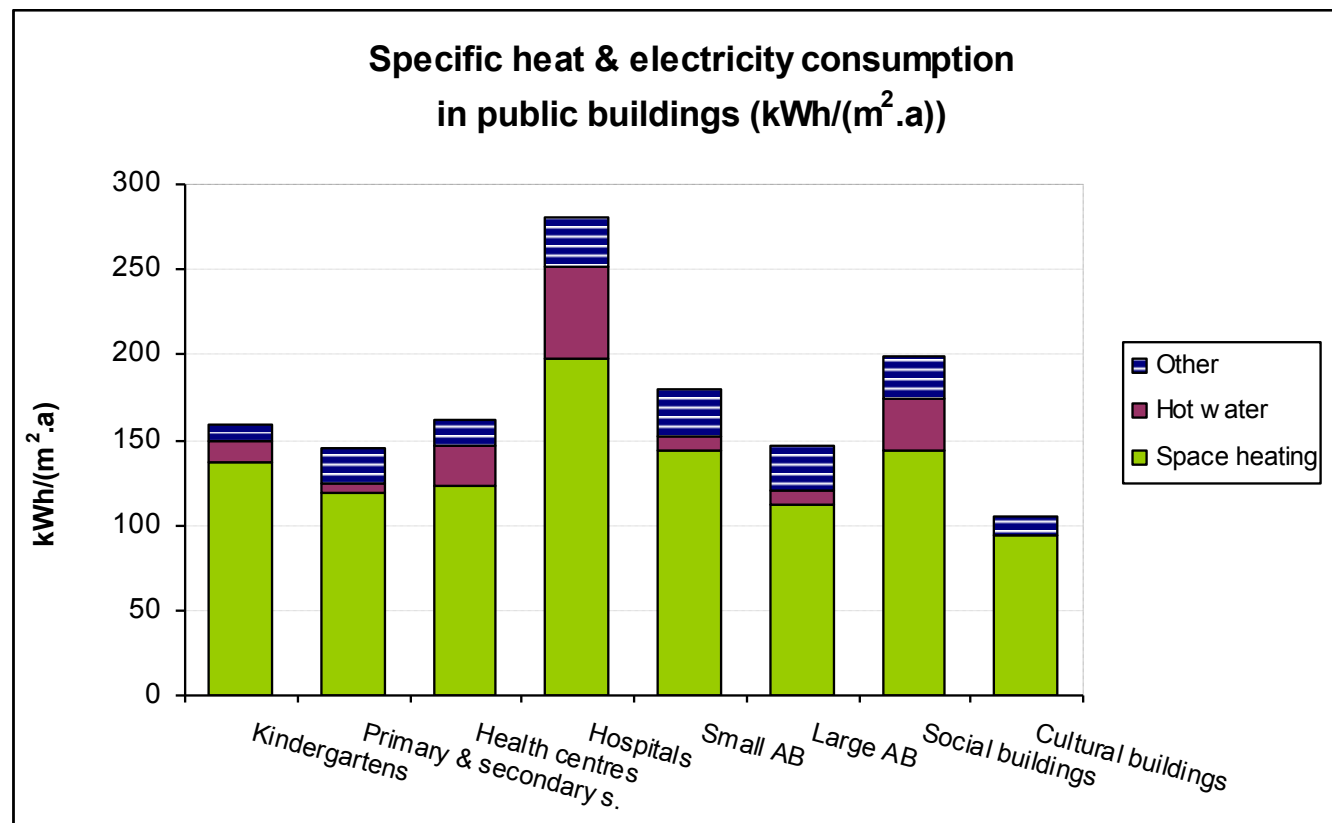
- To prepare a model for projection of final energy consumption in public sector, energy savings potential and related costs
- **3 scenarios:**
 - BAU
 - Energy saving scenario I.
 - Energy saving scenario II.

Modeling tool

- Based on model used for PhD dissertation „Energy savings potential in Hungarian public buildings“
- Performance-based approach (only)
- Major adjustments of input data and update of parameters for the SK conditions
- Time line and minimum requirements adjusted

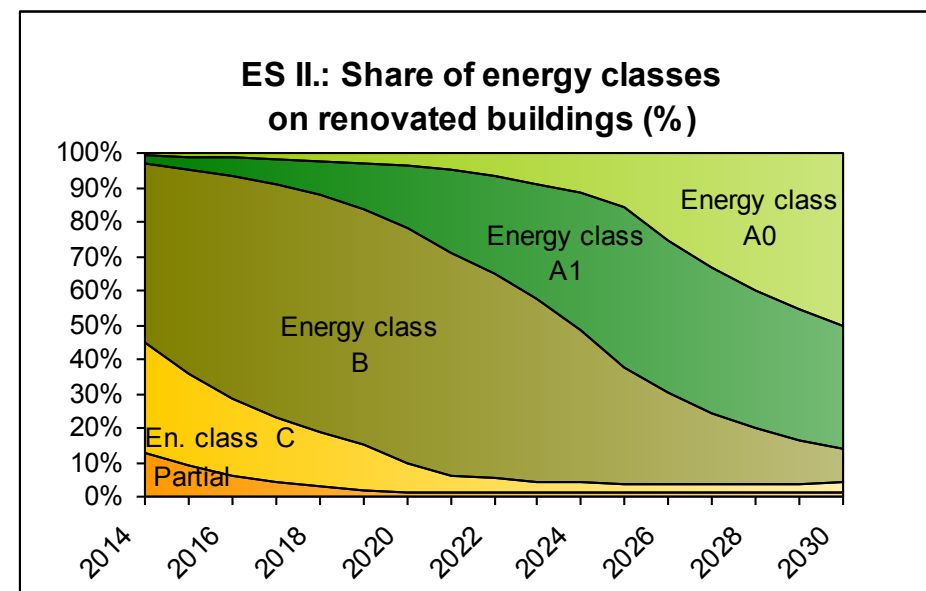
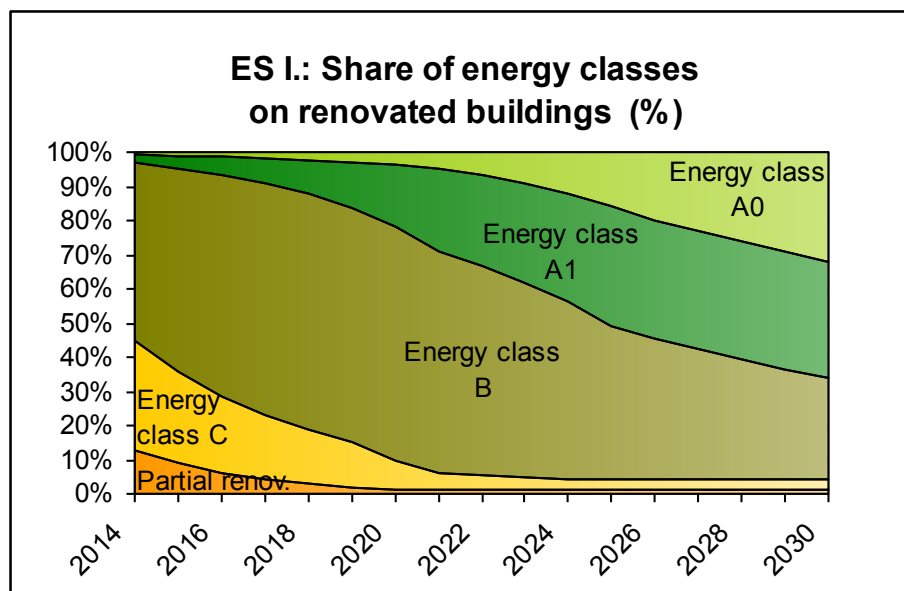
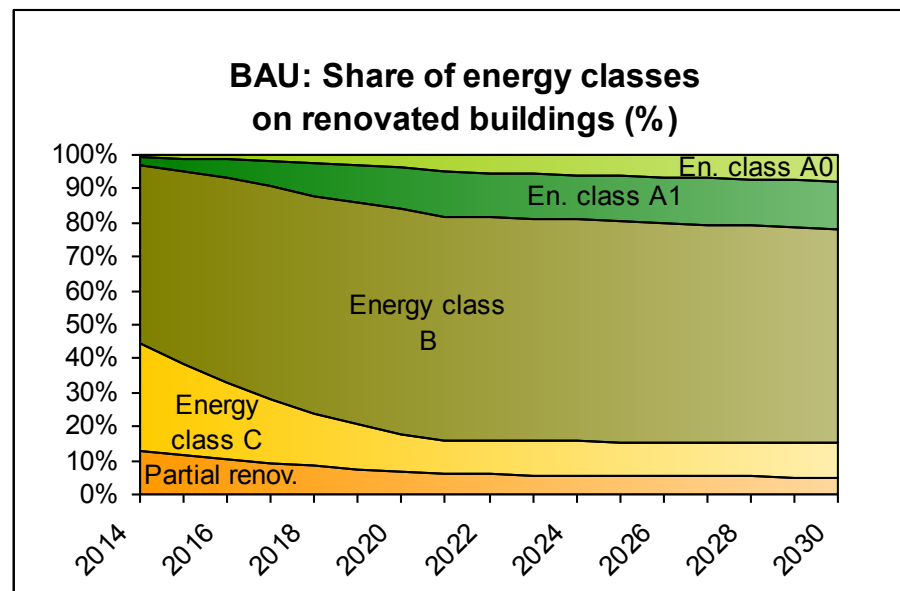
Input data

- Data on Slovak public building stock
- EA of 250 blds, SIEA



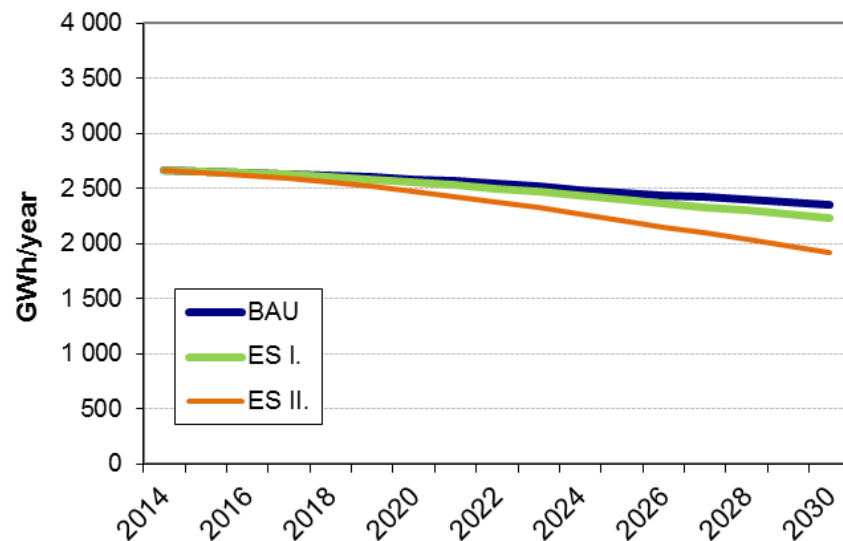
3 scenarios

Scenario	Description	Adherence to minimum req.	P&M
BAU	Historical trend of renovation rate (2010-14): 1,76 %/a	- New: fulfilling min. requirements - Retrofit: fulfilling min. requirements in current rate	
Energy saving scenario I.	Existing & planned fin. mech. in 2016-2030: 1,8%/a	- New: fulfilling min. requirements - Retrofit: improvement in fulfilling min. requirements	- Better control of ECB, sanctions - Support for quality projects only - Training of installers
Energy saving scenario II.	- Existing & planned fin mech in 2016-2030 - New fin mech	- New: fulfilling min. requirements - Retrofit: even higher improvement in fulfilling min. requirements	- In addition to ES I.: - Pilot projects - Additional financial mechanism for support of high quality retrofit projects

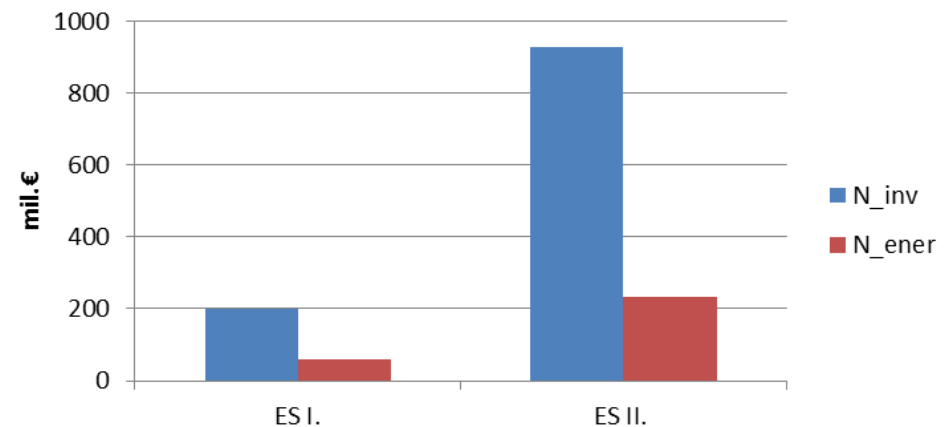


Results: Energy savings - 2030

Final energy consumption for space heating in public buildings, BAU vs. US I., 2014-2030 (GWh/year)

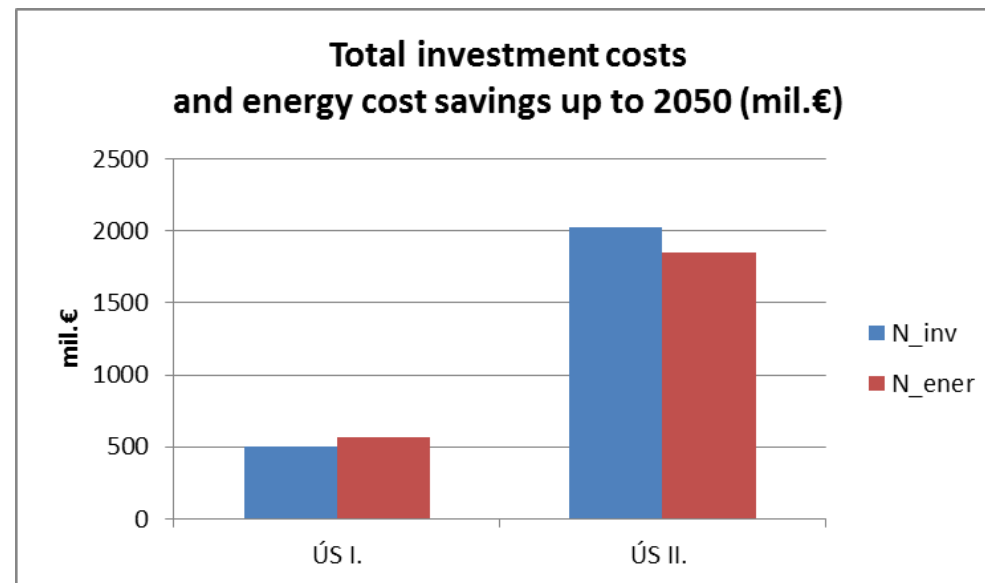
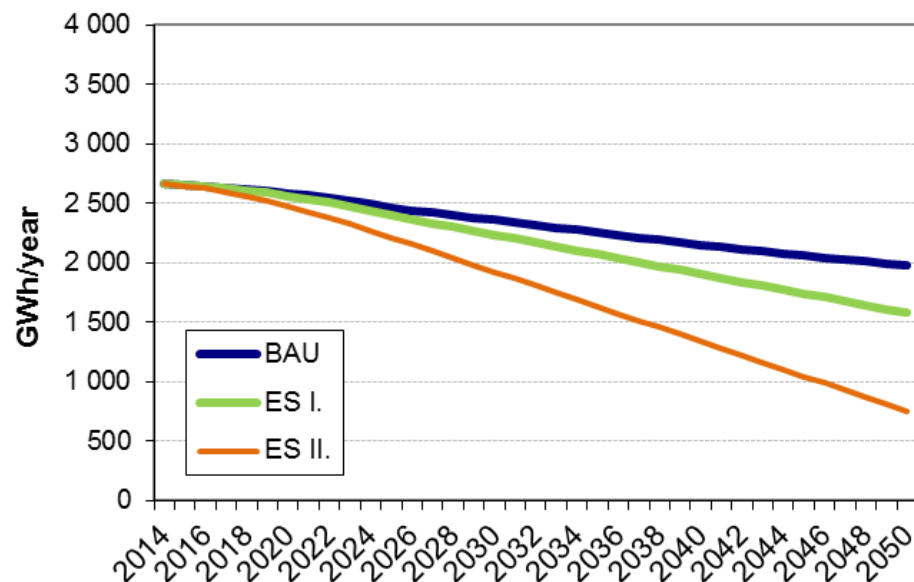


Total investment costs and energy cost savings up to 2030 (mil.€)



- The results showed that the set timeframe is too short to generate energy cost savings comparable to the investments needed

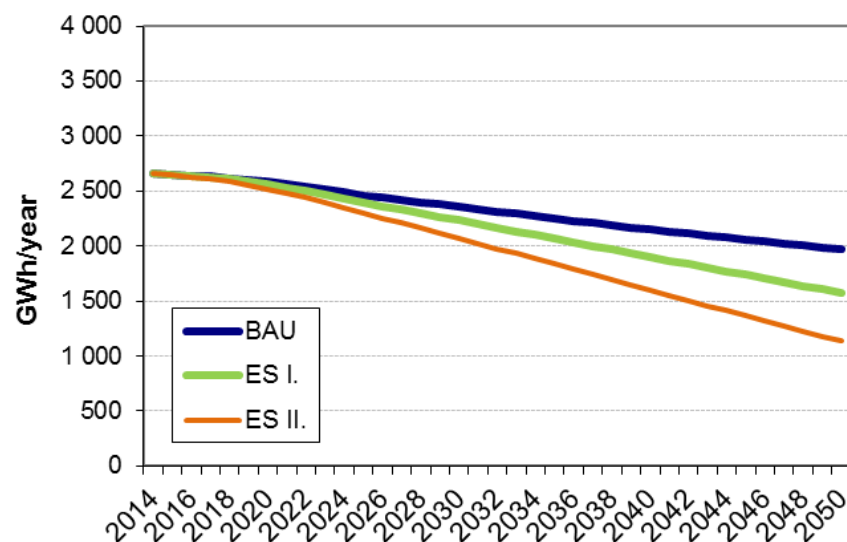
Energy savings: 2050



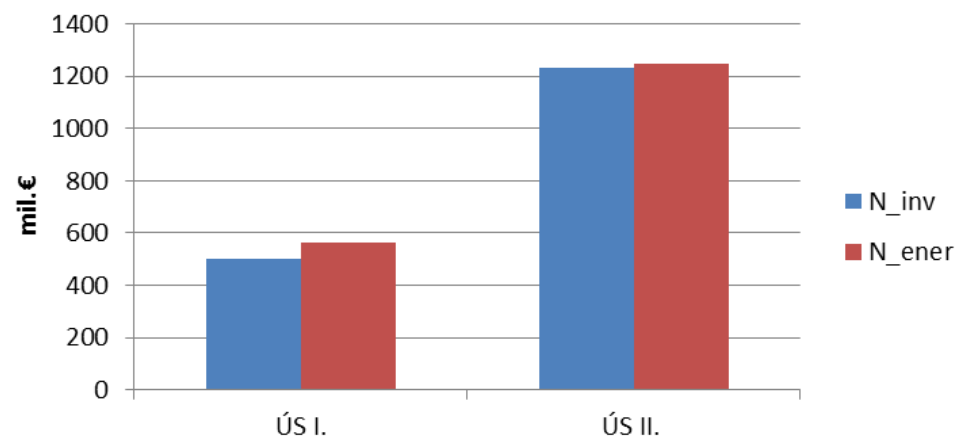
- By 2050 the energy cost savings exceeded the investment costs only in ES I.

Energy savings: 2050 (2)

Final energy consumption for space heating in public buildings, BAU vs. US I., 2014-2050 (GWh/year)

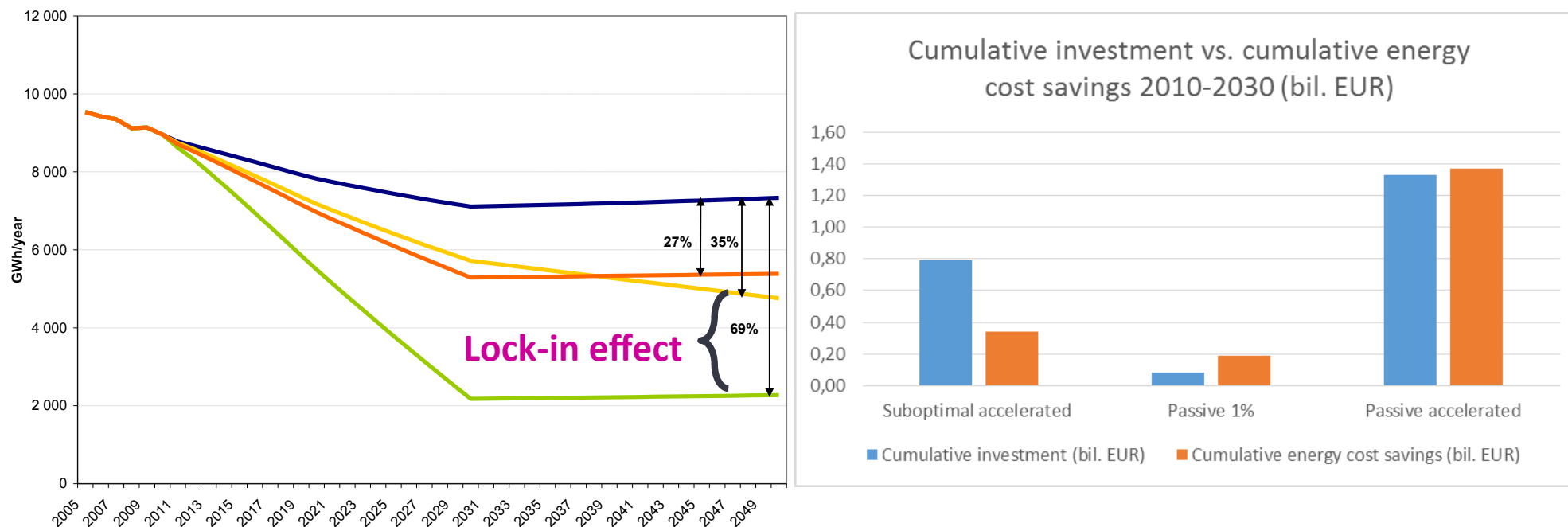


Total investment costs and energy cost savings up to 2050 (mil.€)



- Further research searched for the cost-effective level of retrofit rates.

Energy savings potential in Hungarian PB



- Highest energy saving potential – Pass acc scen (at a high cost)
- The investment costs of the Suboptimal scen largely exceed its financial benefits
- By 2050 benefit of gradual retrofit to passive standard (Passive 1%) overruns energy savings of massive suboptimal retrofit (Subopt scenario) – at lower investment costs than Subopt scen

Conclusions

- Model proved applicable to another country
- 3% renovation towards NZEB too costly
- Measures necessary:
 - Incentives to decrease additional costs
 - Pilot projects
 - Additional financial mechanism
 - Sanctions
- Further research:
 - Sensitivity analysis
 - User-friendliness of the model
 - Dynamic cost- benefit analysis



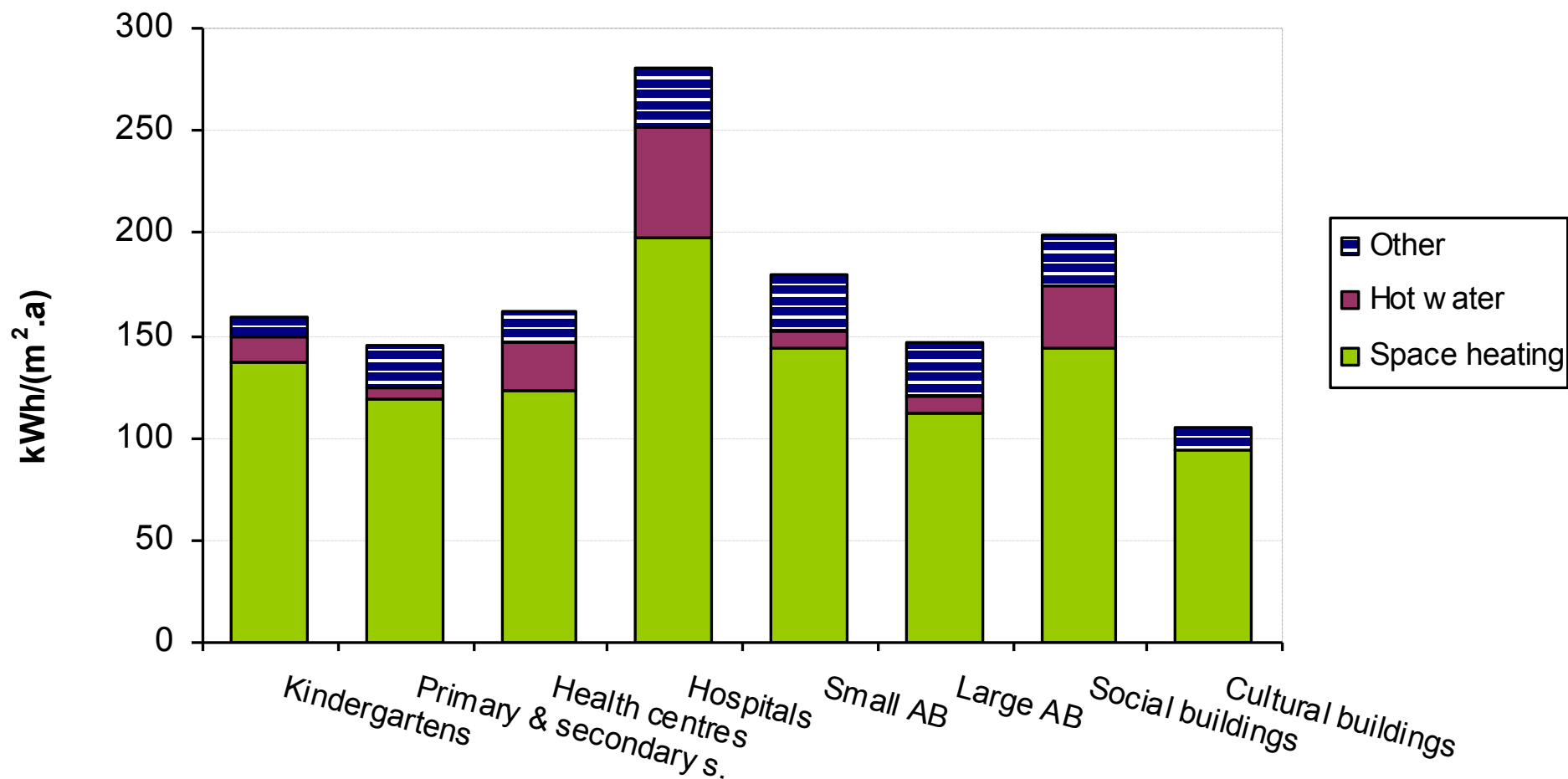
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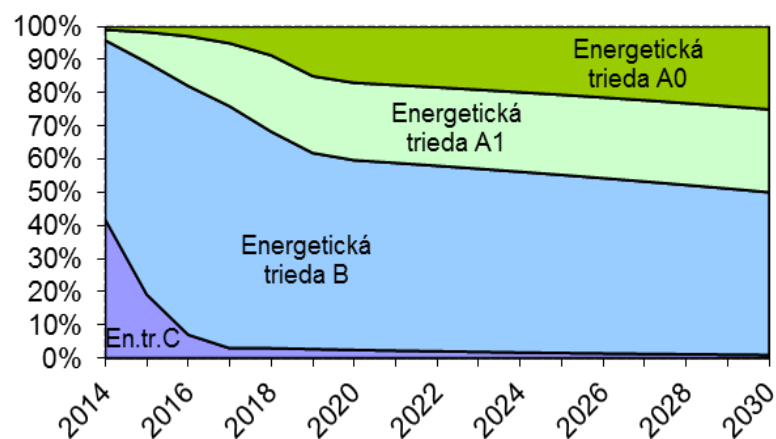
Background slides

Specific heat & electricity consumption in public buildings (kWh/(m².a))

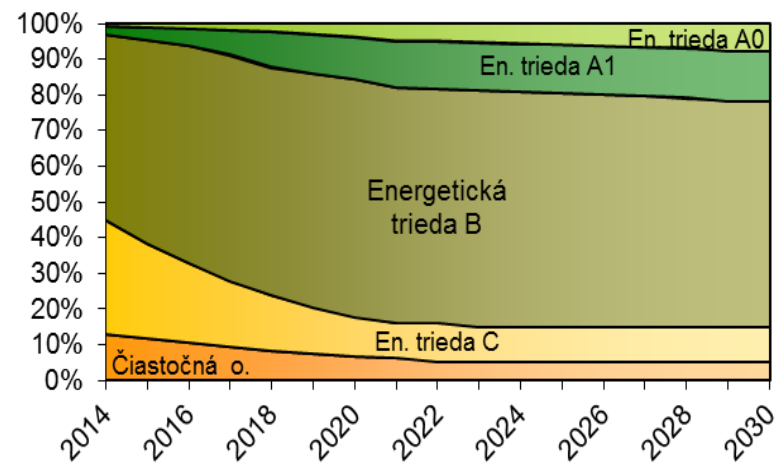


BAU

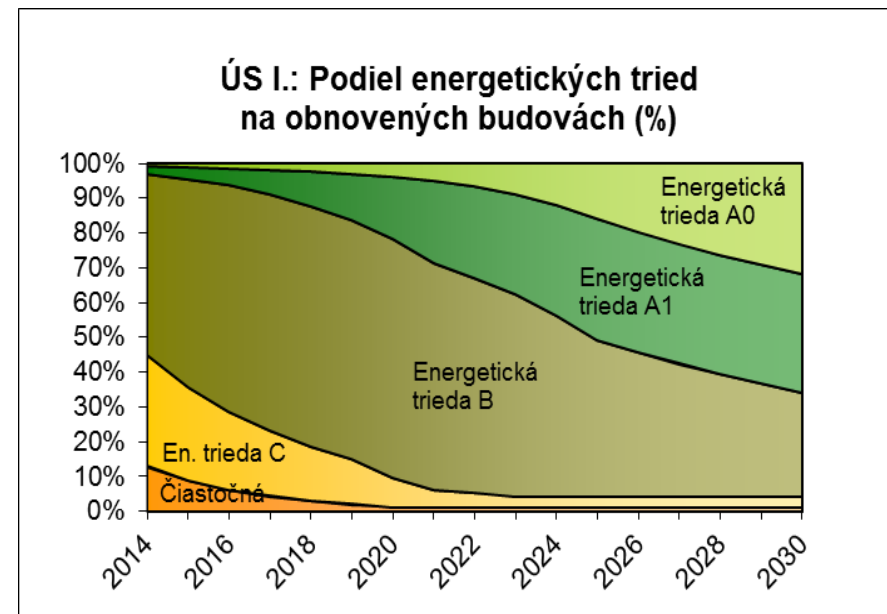
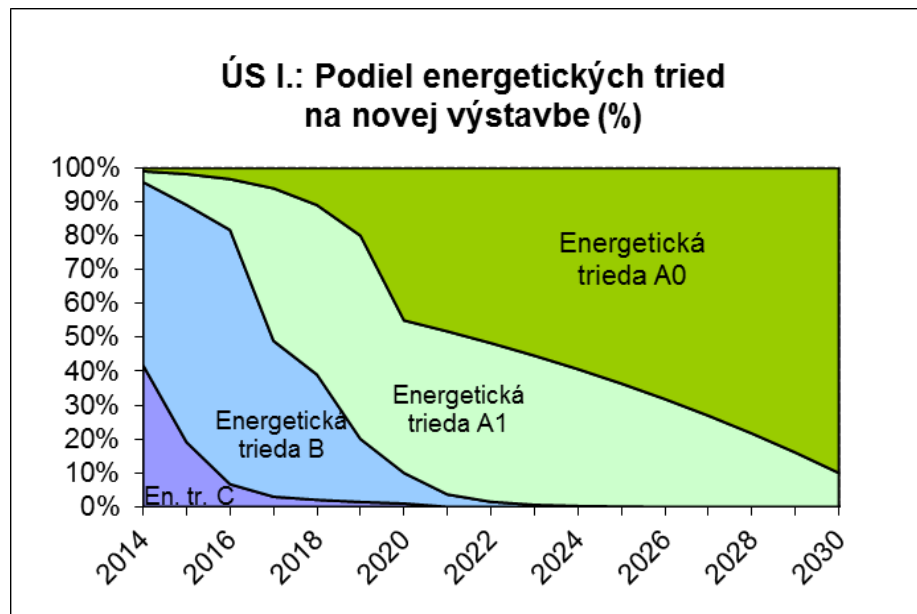
BAU: Podiel energetických tried na novej výstavbe (%)



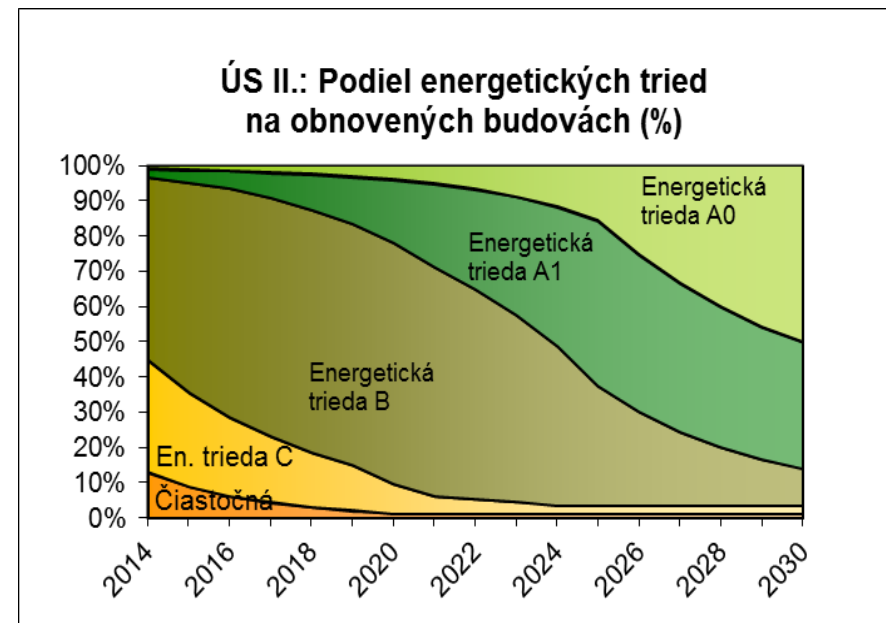
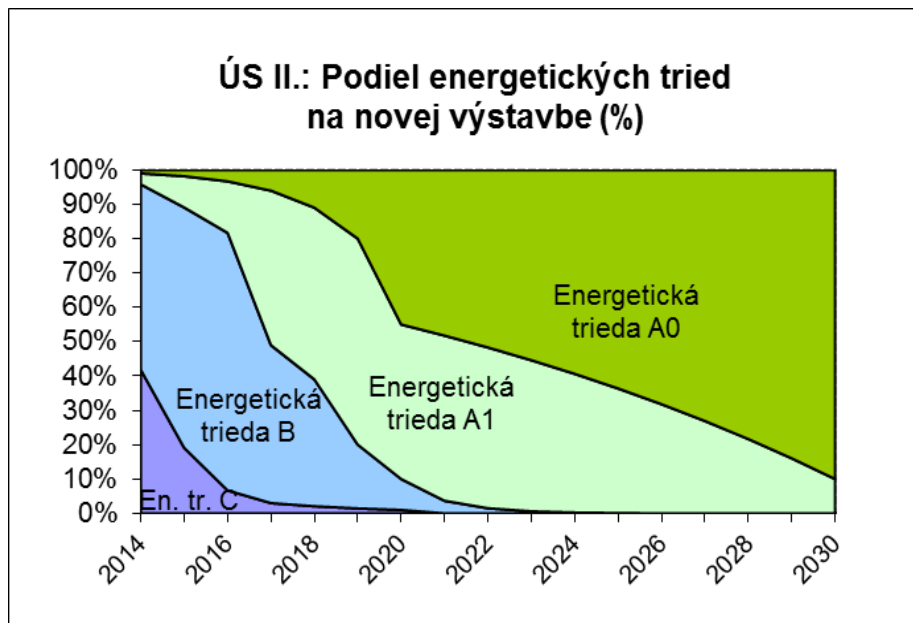
BAU: Podiel energetických tried na obnovených budovách (%)

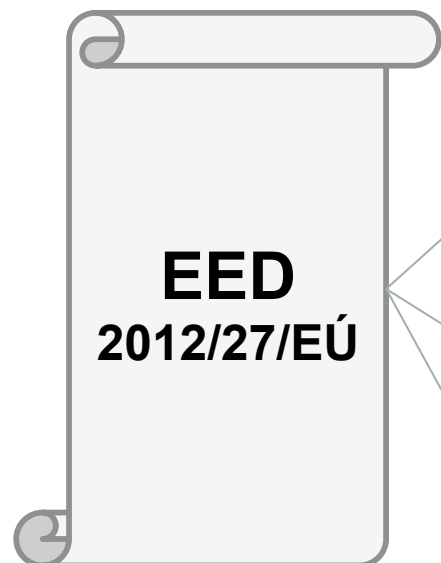


Energy savings scenario I.



Energy savings scenario II.





Cieľ pre povinné schémy energetickej efektívnosti

1,5% z ročného predaja
energie

948 GWh/rok

26 tis. GWh_{kum}

Obnova budov ÚOŠS:

3% z cpp budov ÚOŠS

Národný indikatívny cieľ:

KES, PES₂₀₂₀

RS 2015

Pracovné skupiny

- Zodpovedné osoby podľa UV č. 350/2014
- Stála medzirez. komisia pre prípravu AP

Zber a kontrola dodania

- Požiadavka
- Zber
- Kontrola dodania a správnosti
- Dožiadanie údajov a ich oprava
- oslovenie nových inštitúcie za nové op.

- BUD.
- Priemysel
- VS
- Doprava
- Spotrebiče
- Energetika
- Horizontálne op.

Metodika

- Tabuľky pre vyhodnocovanie
- Metodické tabuľky (3AP + aktual.)

Spracovanie

- Spracovanie do tabuliek za jednotlivé opatrenia
- Zohľadnenie špecifity jednotlivých rezortov
- Spracovanie do sumárnej elektronickej plachty

Krížová kontrola

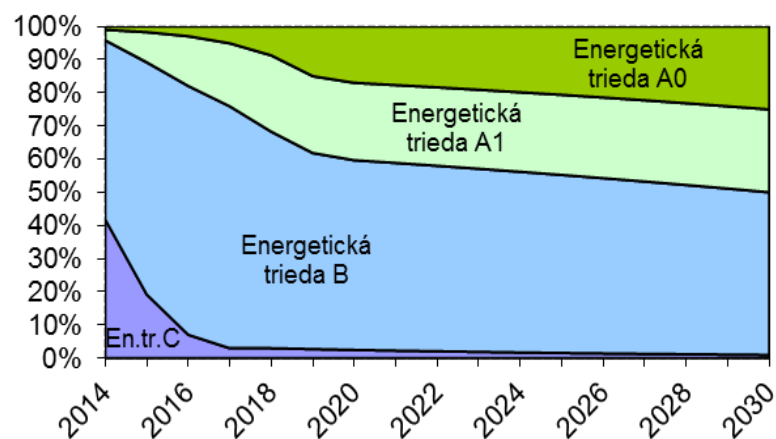
- Krížová kontrola cez investičnú náročnosť (po projektoch)
- Porovnanie s inými zdrojmi a údajmi

Aim of the analysis

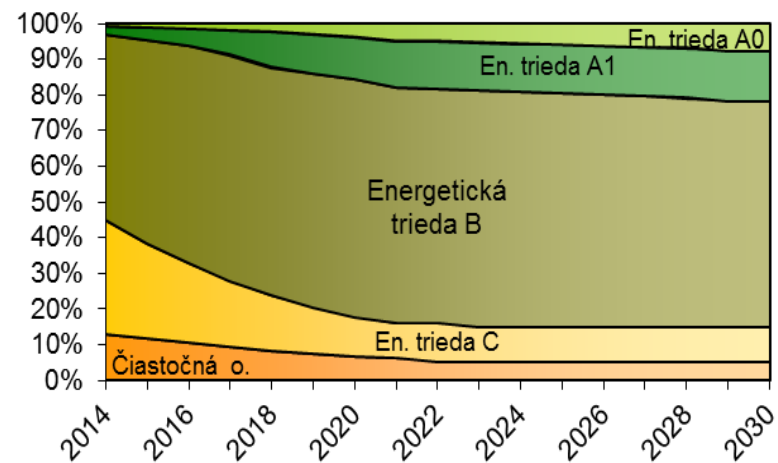
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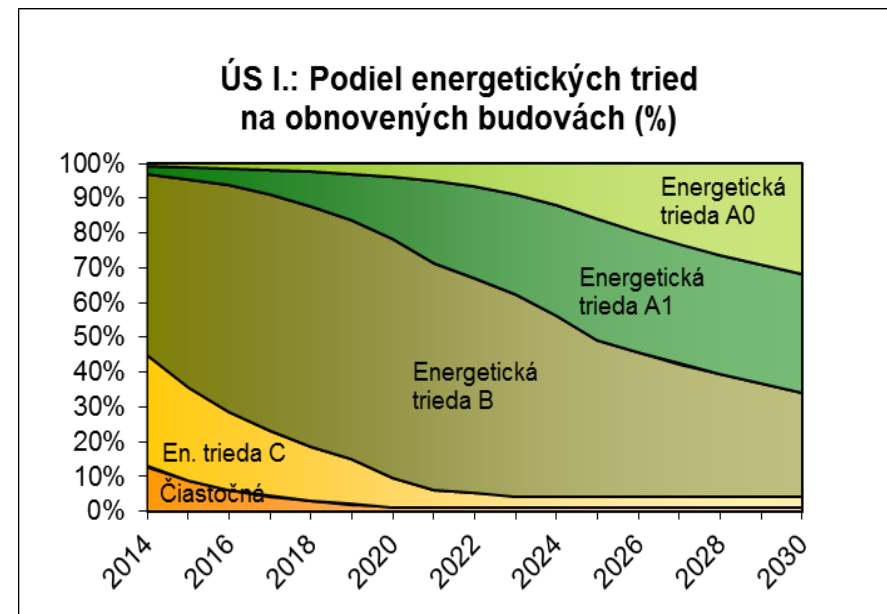
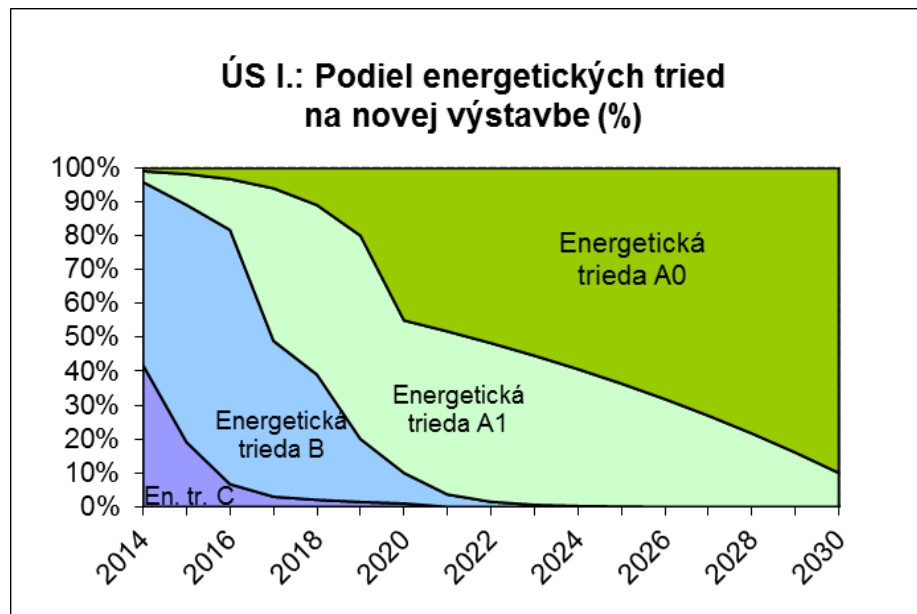
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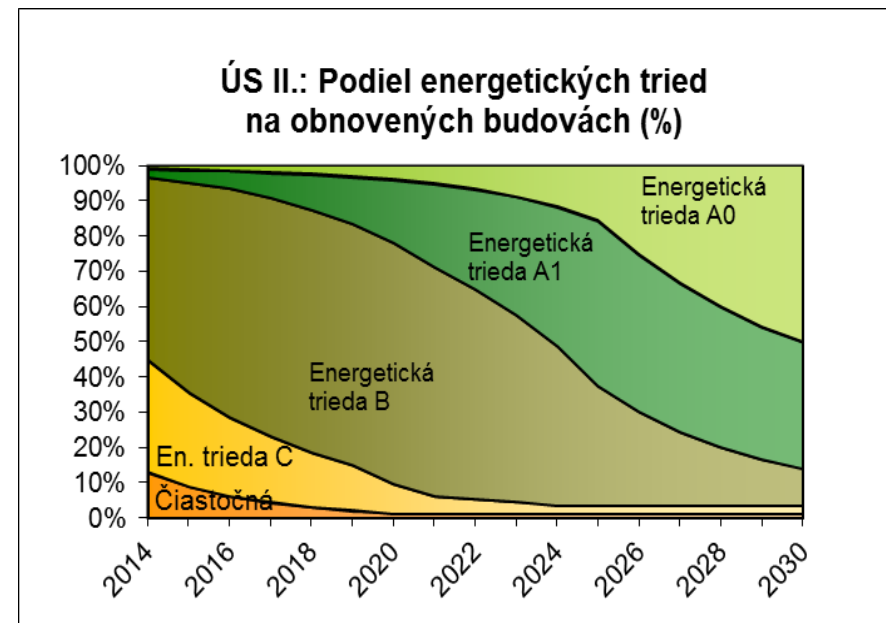
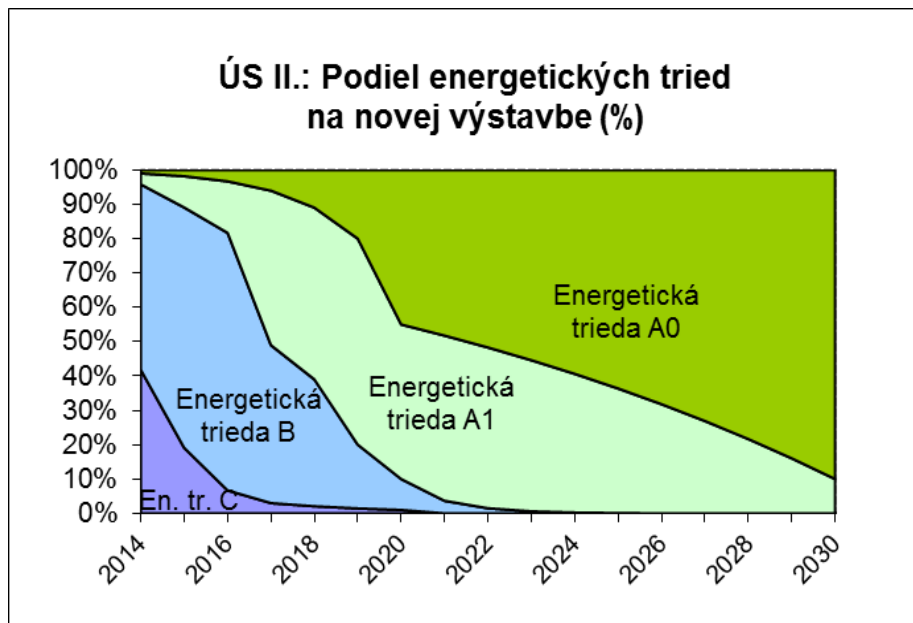
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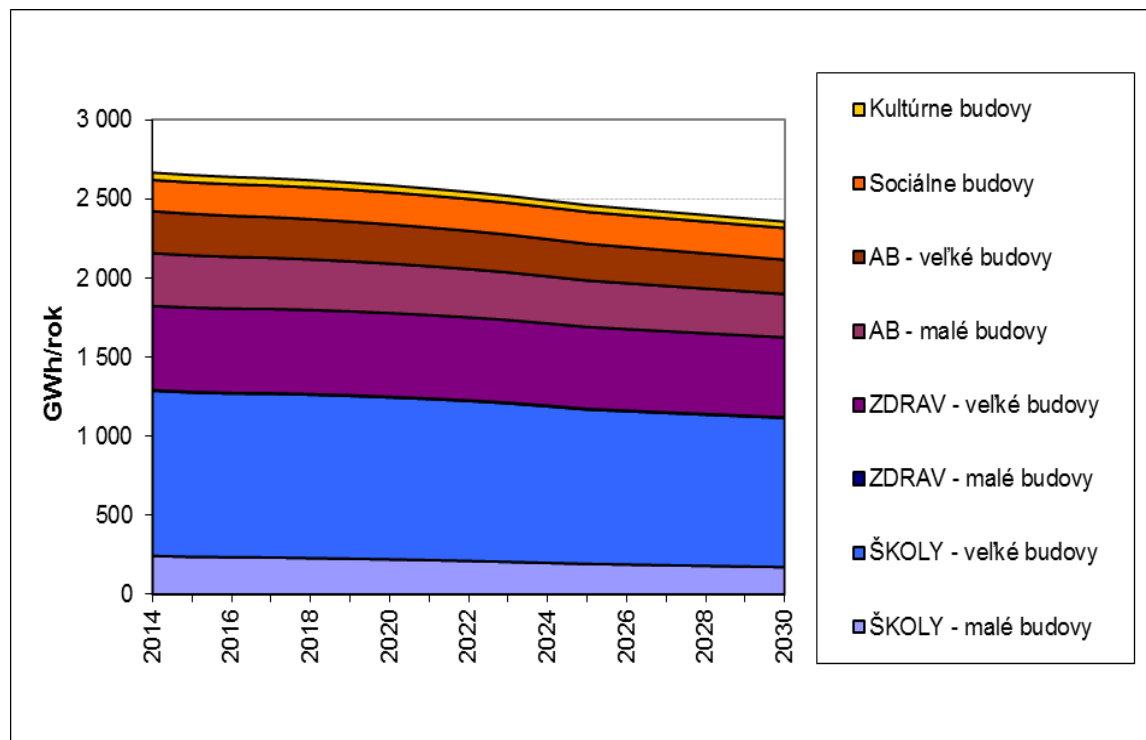
Energy savings scenario I.



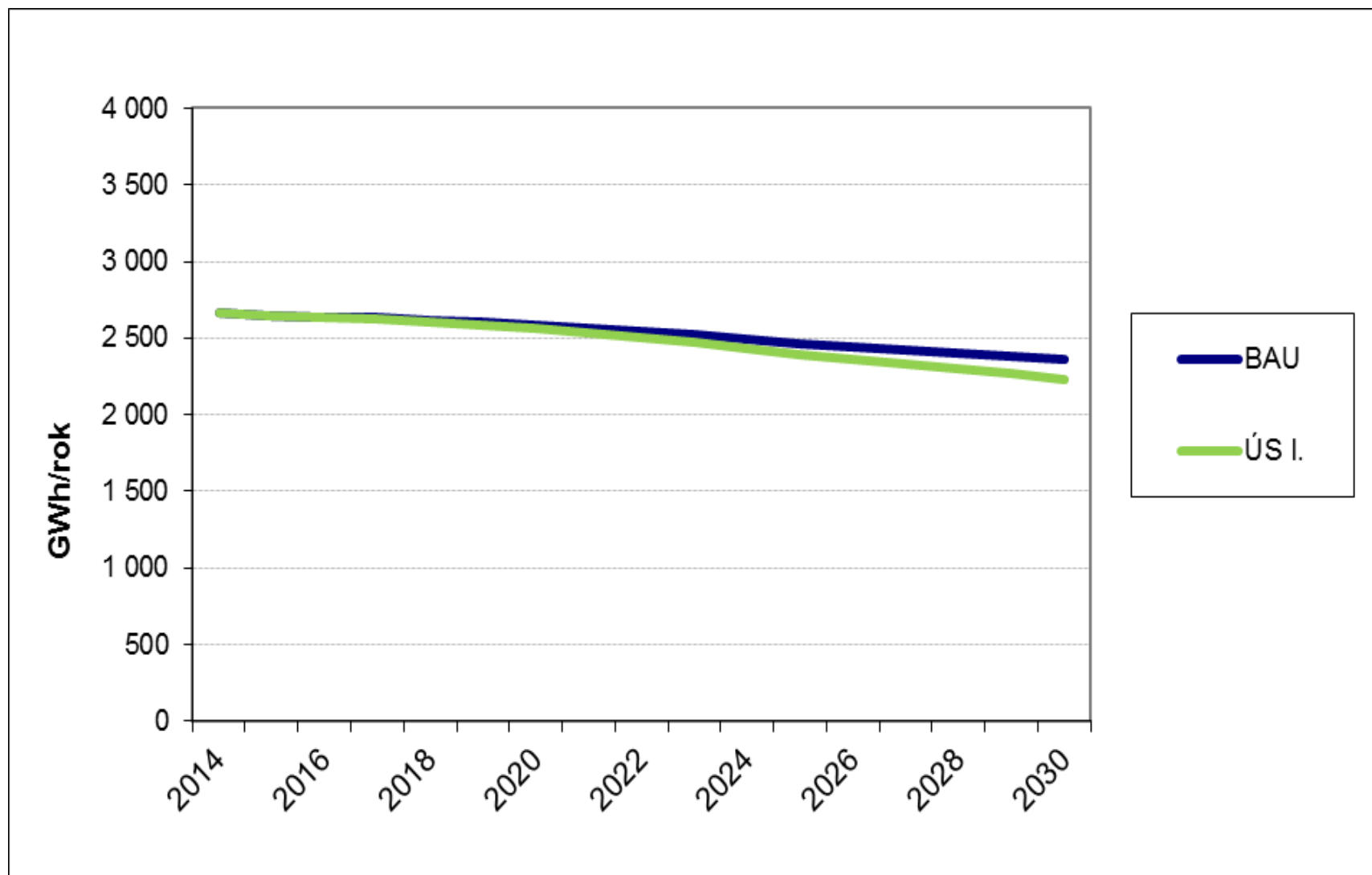
Energy savings scenario II.



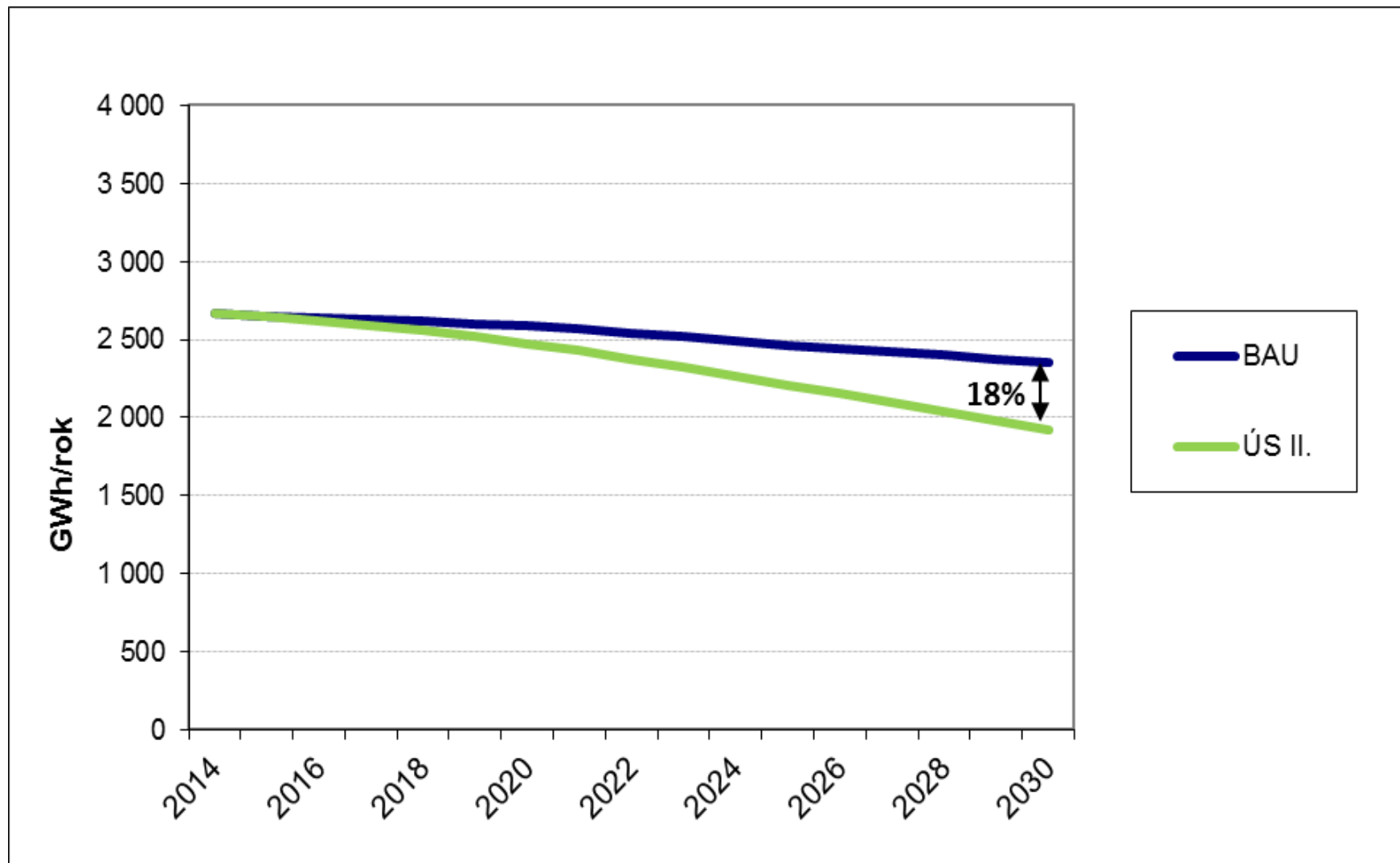
FEC – BAU 2030



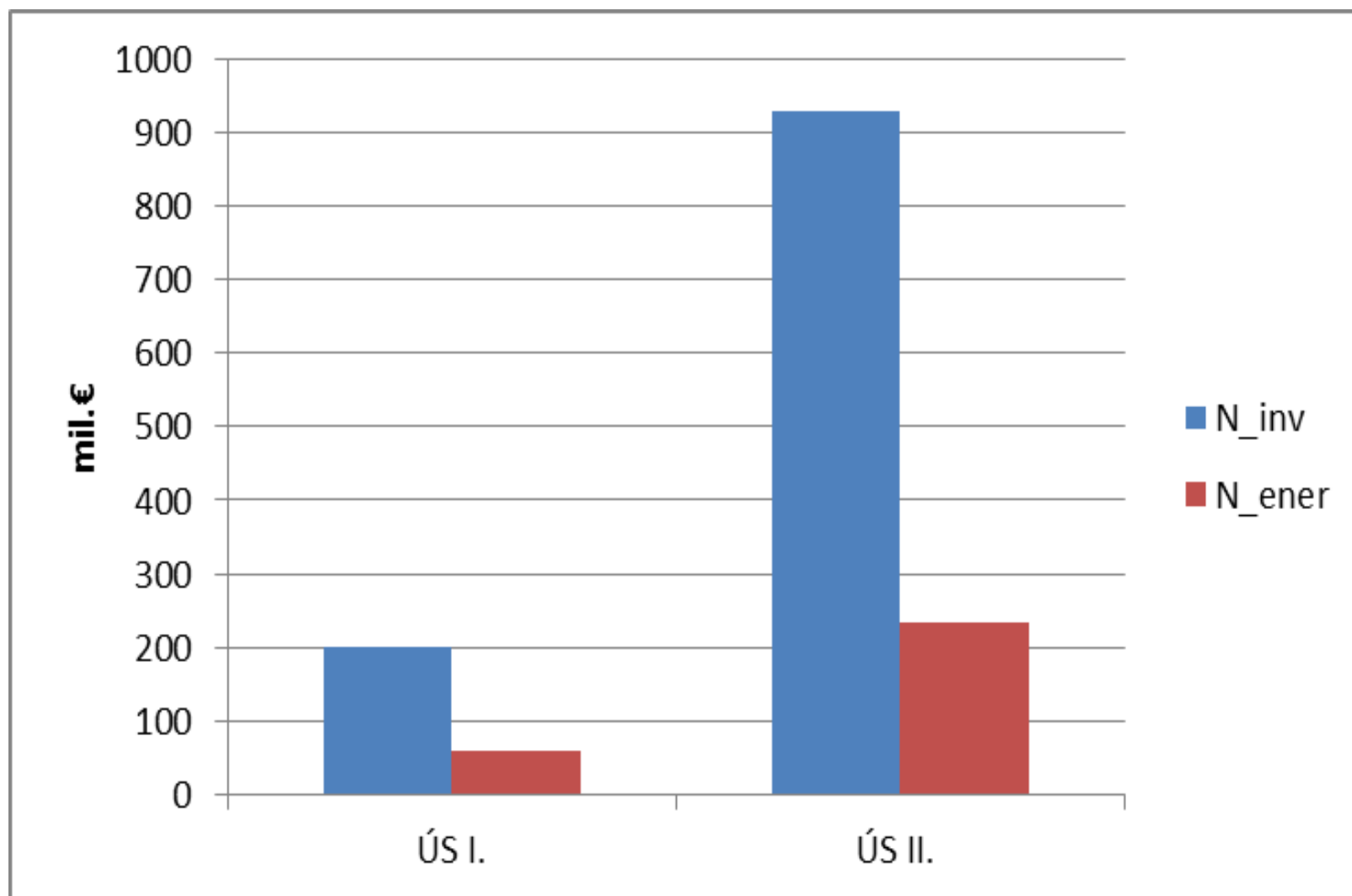
BAU ~ ES I.



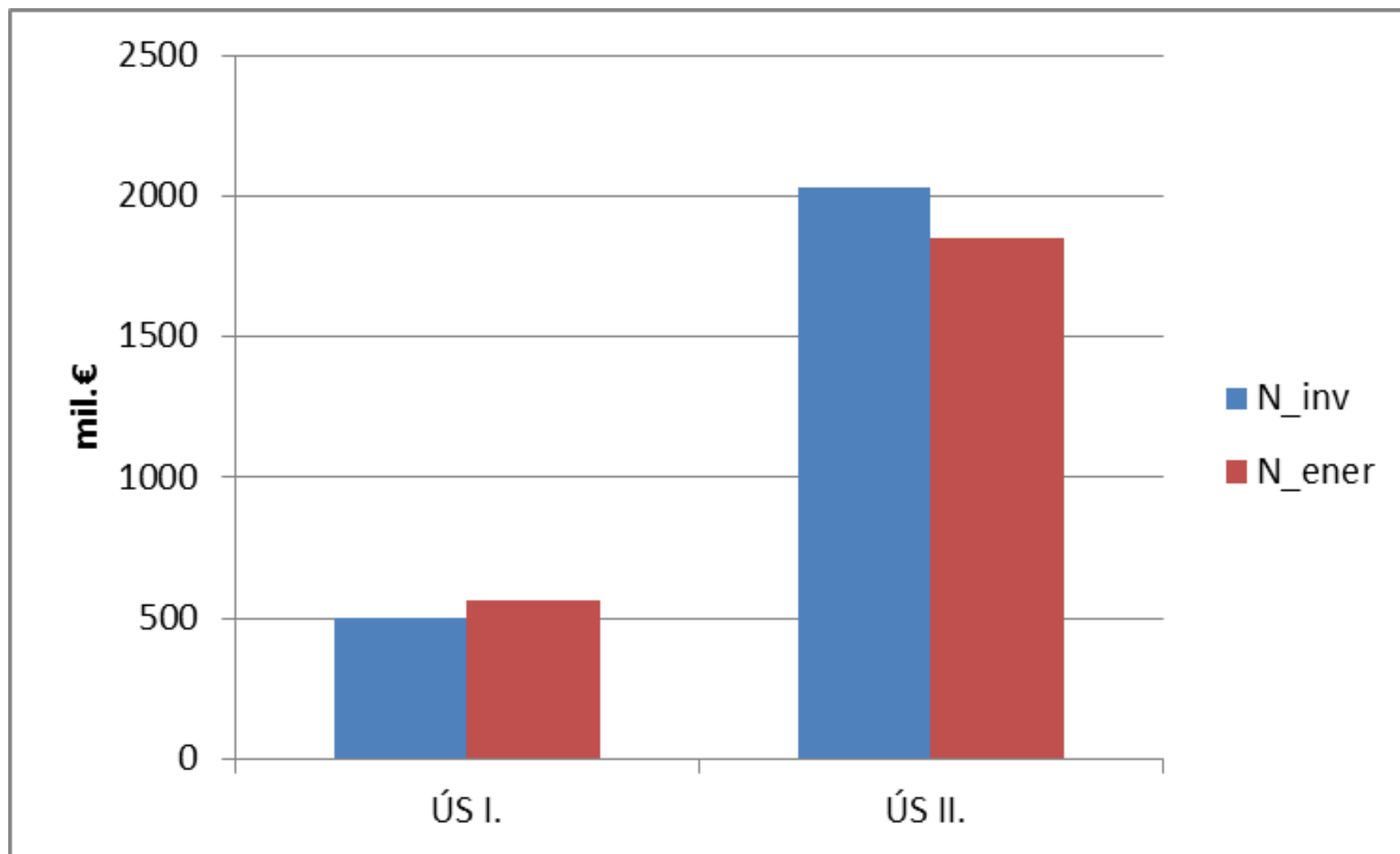
BAU ~ ES II.



INV ~ ECS (2030)

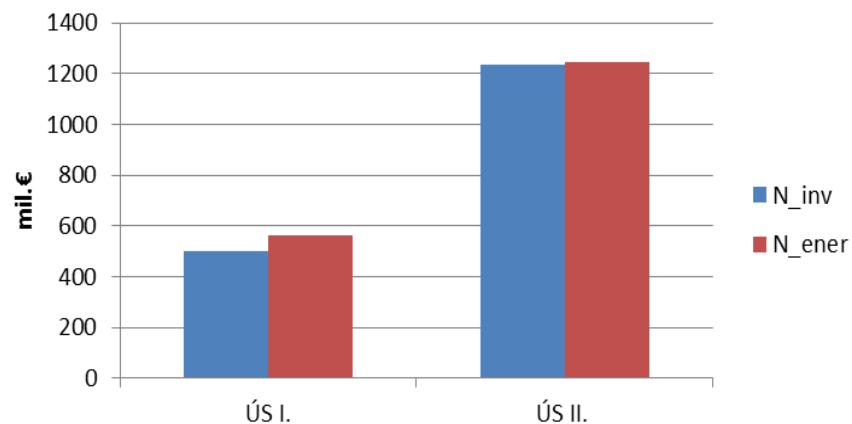


INV ~ ECS (2050): 3% p.a.

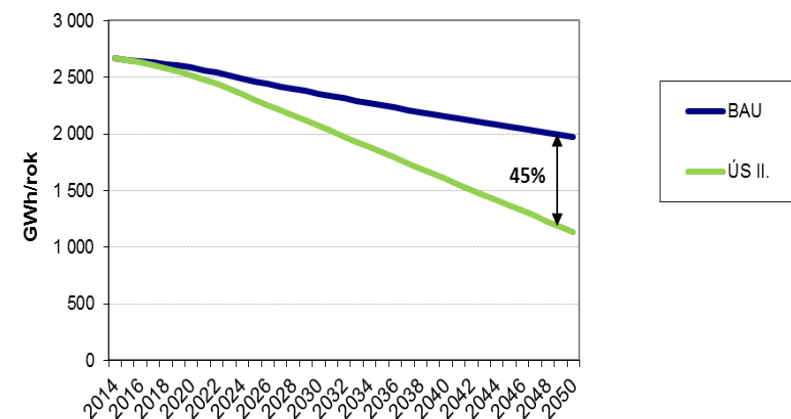


INV ~ ECS (2050): 2,4% p.a.

Celkové investičné náklady a úspory nákladov na energiu do roku 2050 (mil.€)

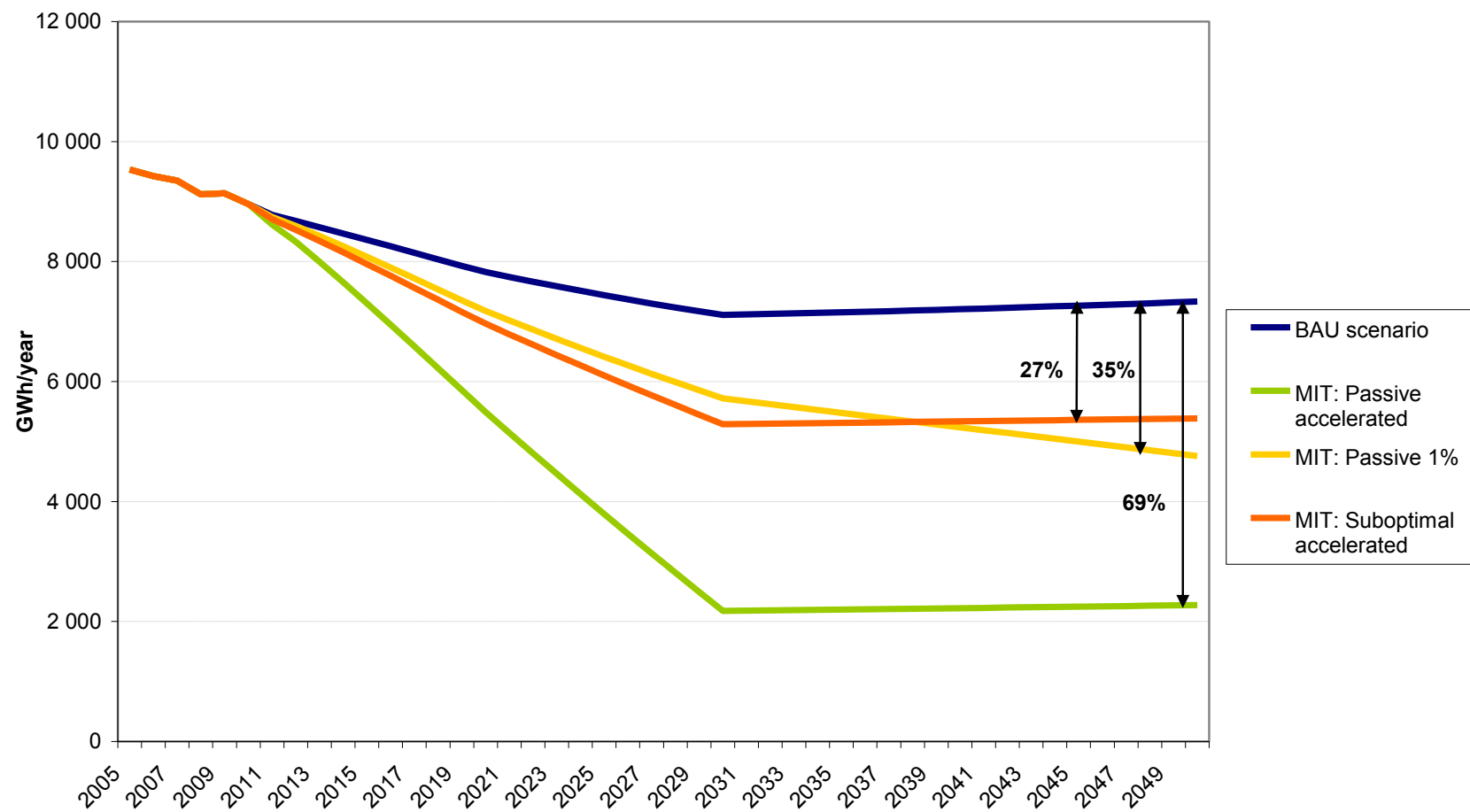


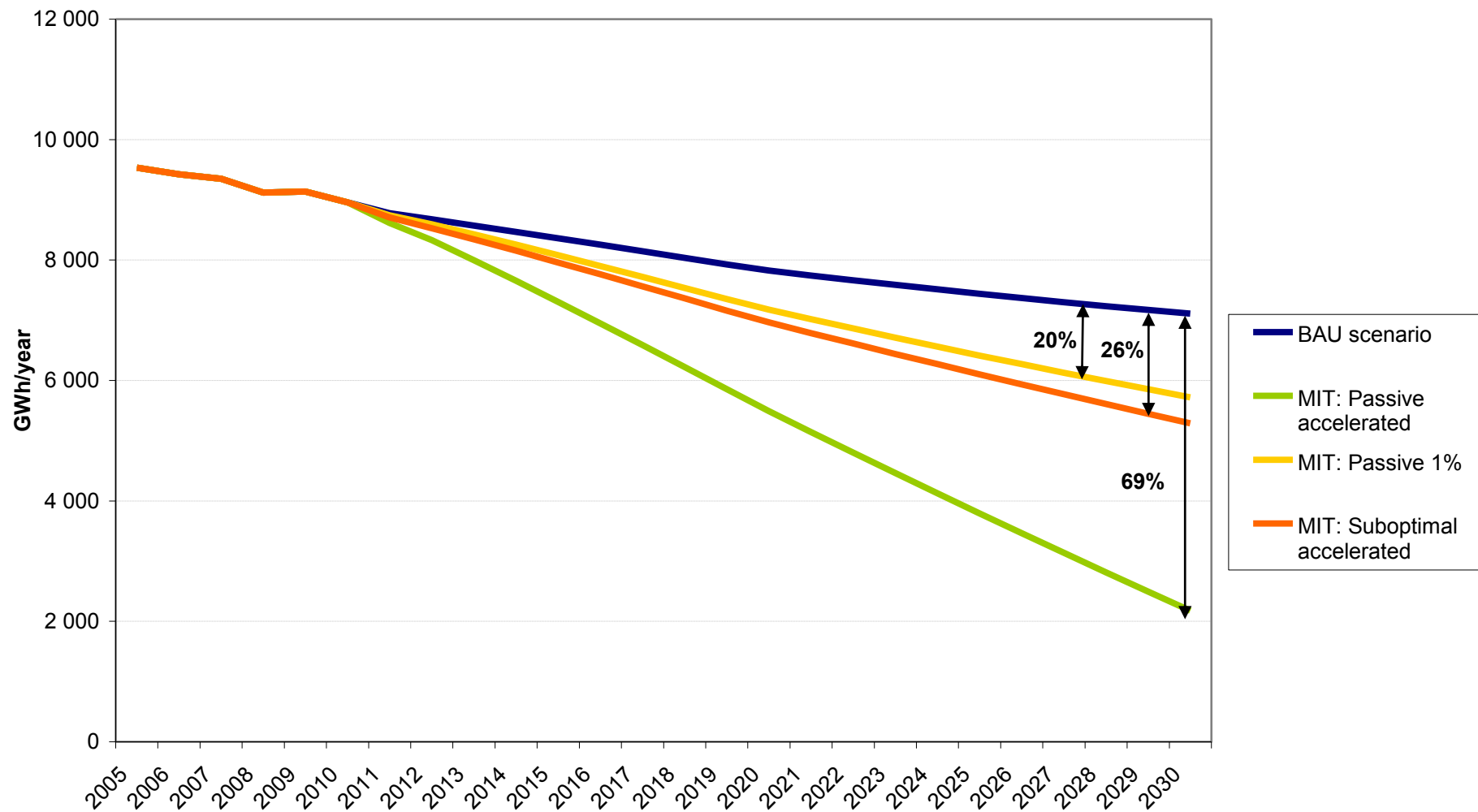
Konečná energetická spotreba na vykurovanie vo verejných budovách, BAU vs. ÚS II., 2014-2050 (GWh/rok)



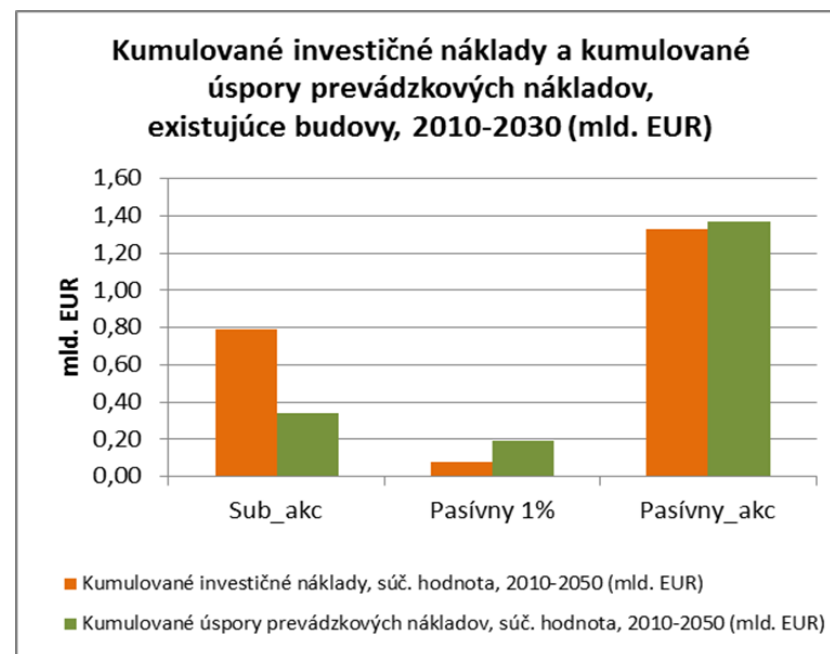
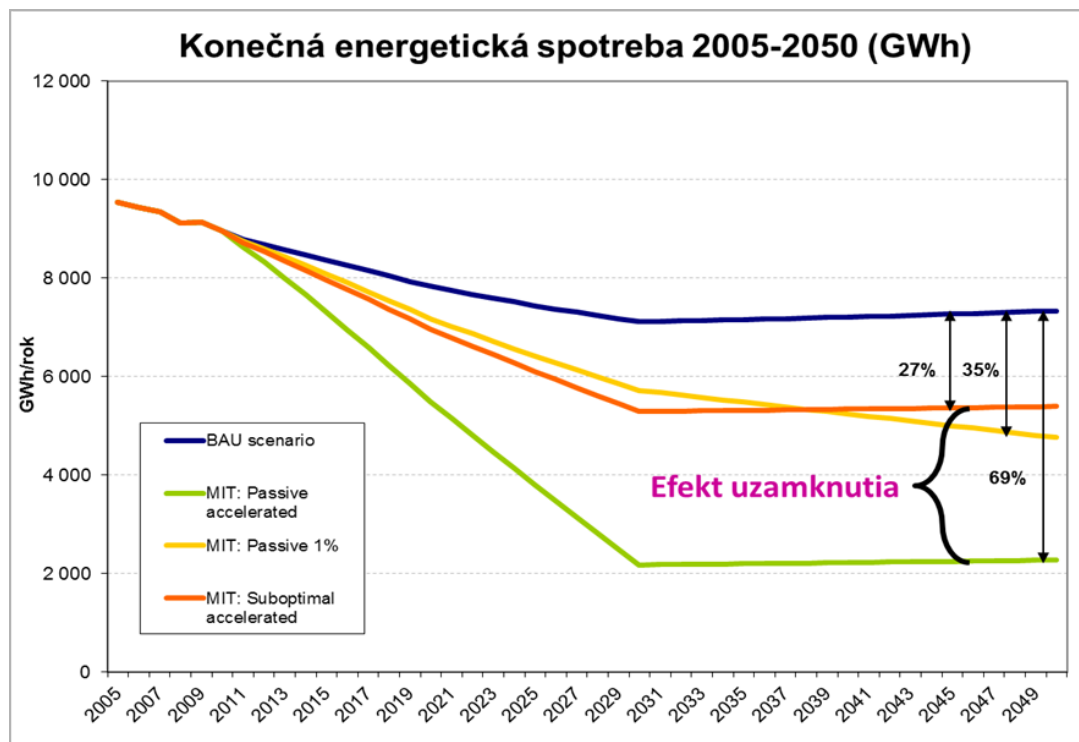


Vyradené



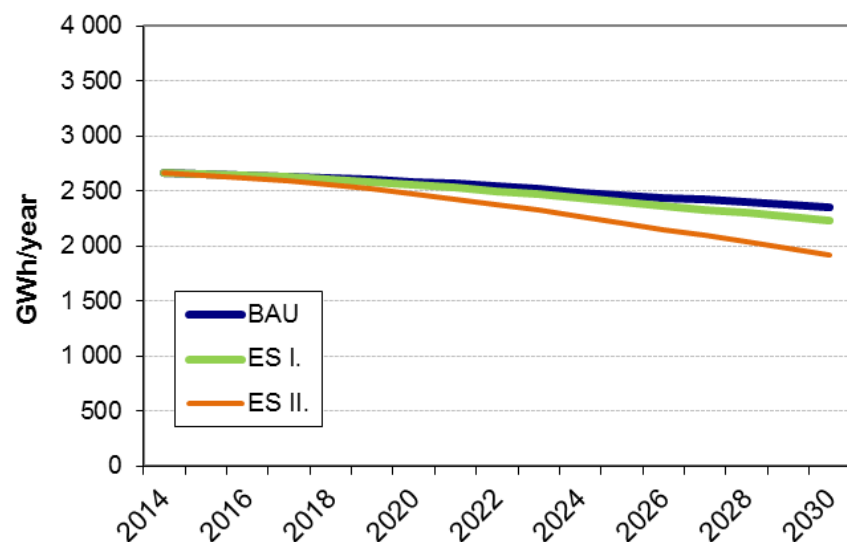


Energy savings potential in Hungarian PB

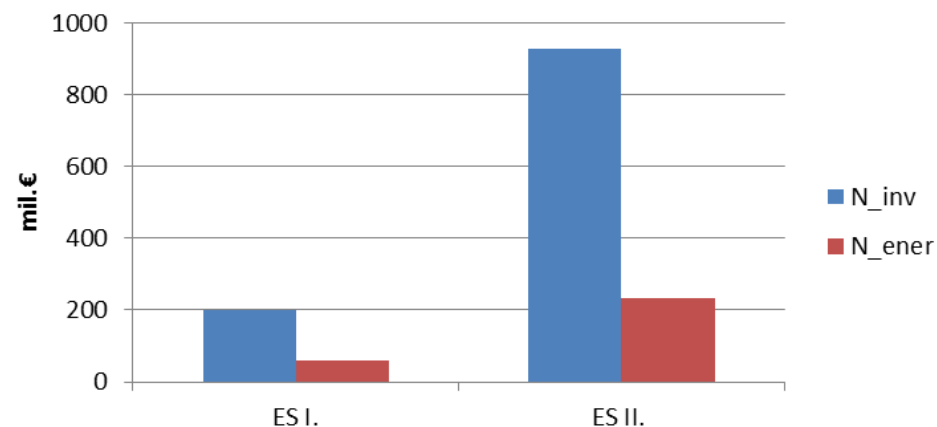


- Najviac finančných úspor vo forme znížených prevádzkových nákladov predstavuje Pasívny akcelerovaný scenár, pri najvyšších investičných nákladoch.
- Suboptimálny akcelerovaný scenár prinesie nepomerne menej úspor v porovnaní s potrebnými investičnými nákladmi.
- Pasívny 1% scenár v dlhodobom horizonte generuje väčšie úspory energie, no pri menších investičných nákladoch v porovnaní so Suboptimálnym akcelerovaným scenárom.

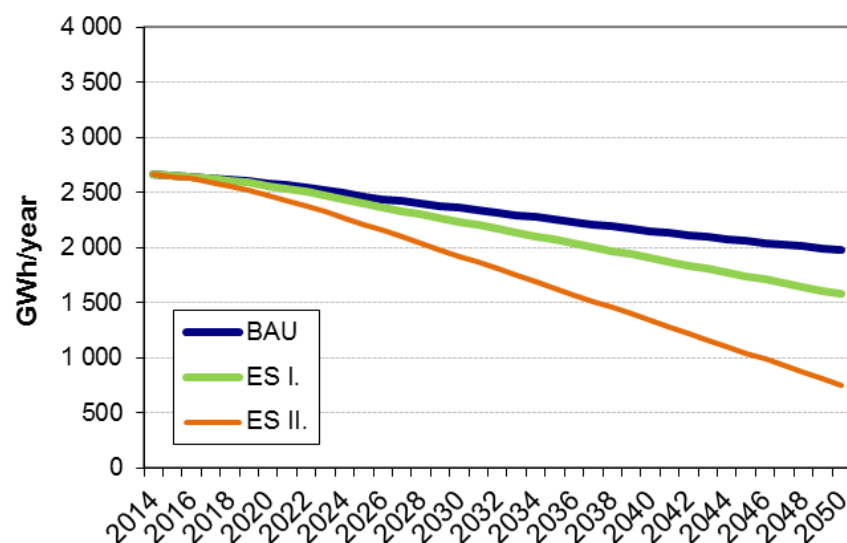
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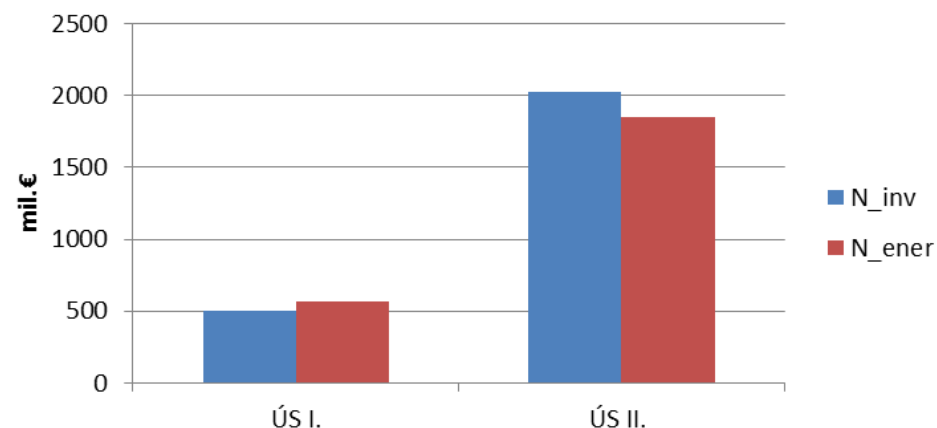
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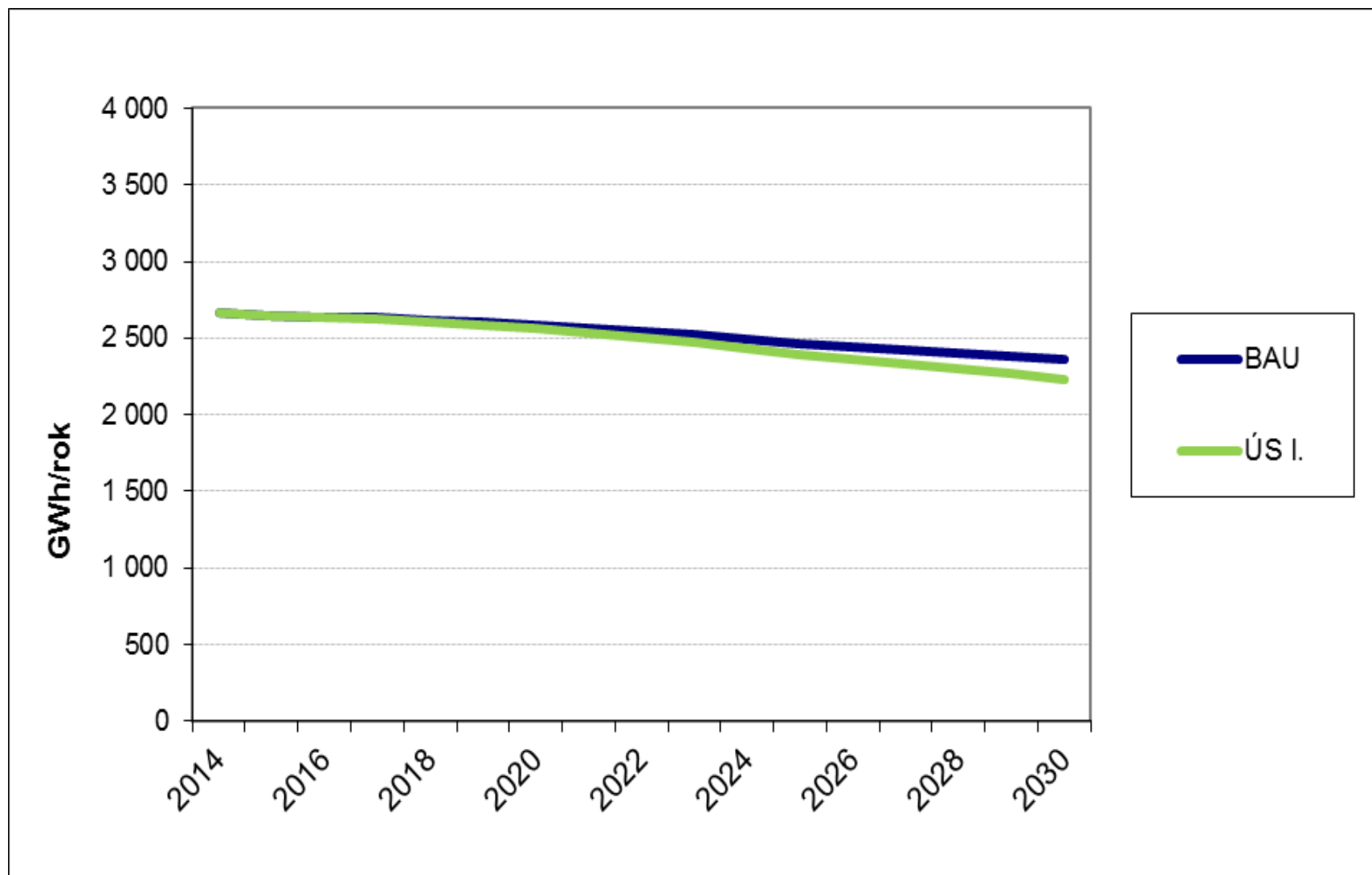
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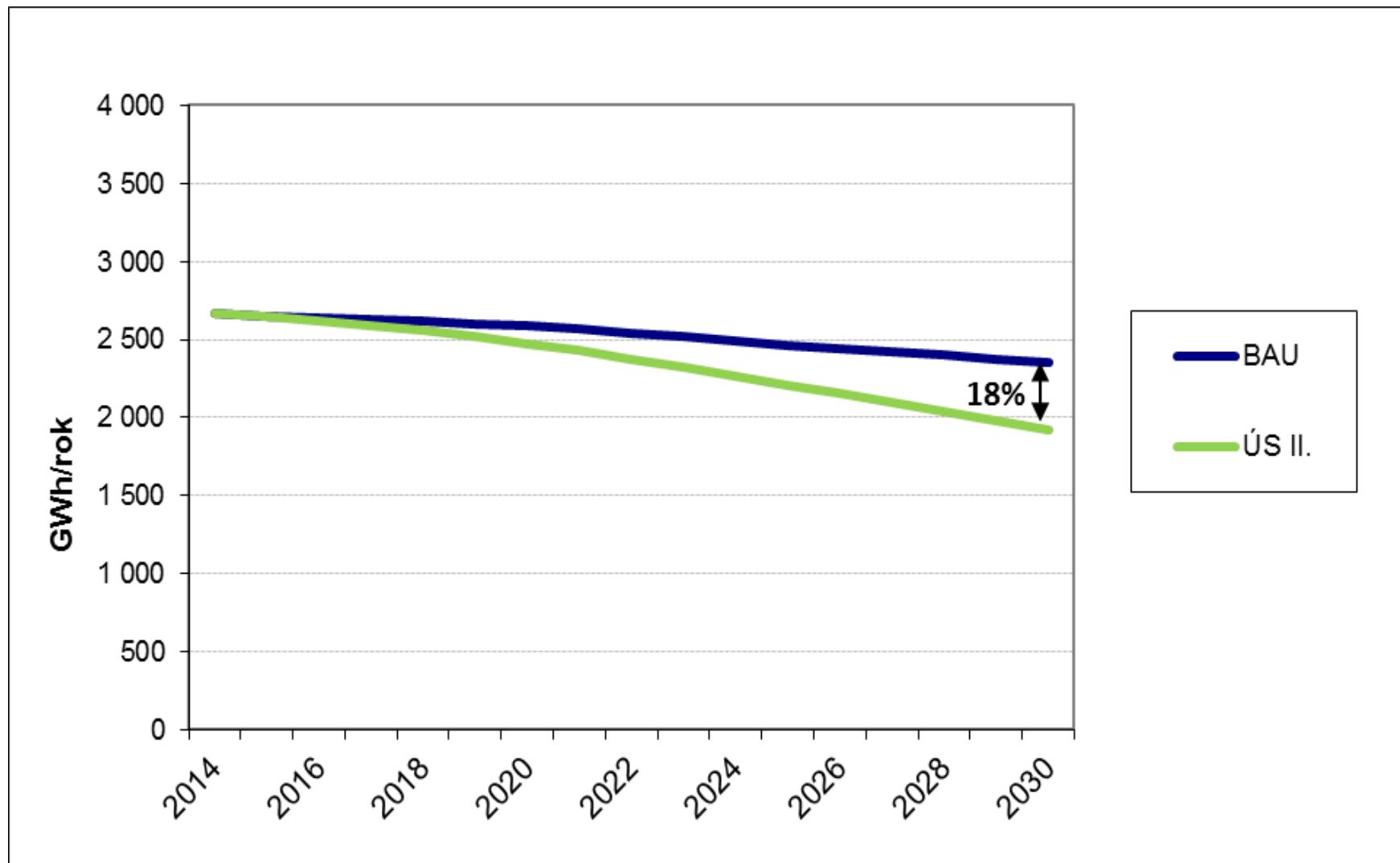
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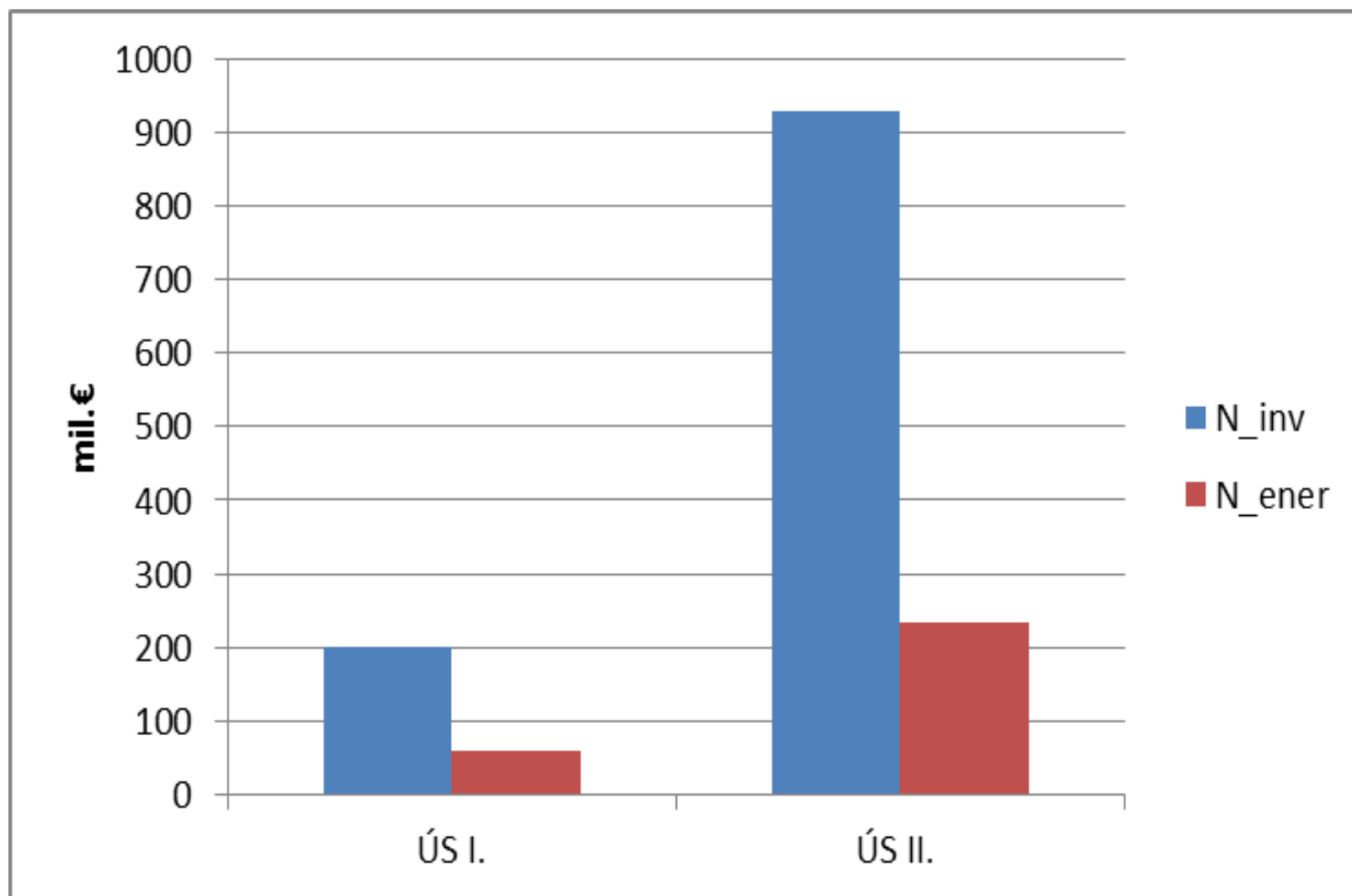
BAU ~ ES I.



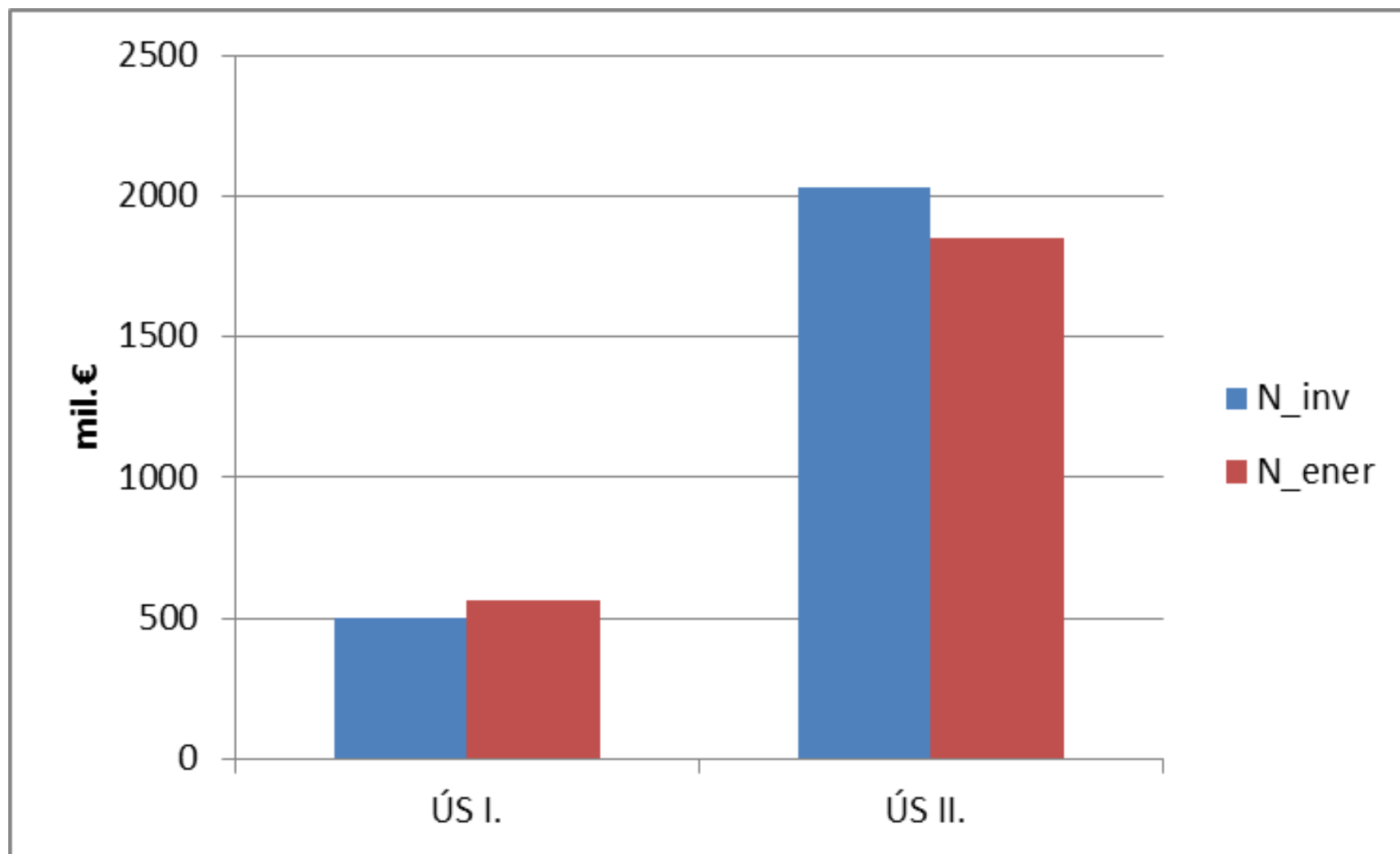
BAU ~ ES II.



INV ~ ECS (2030)

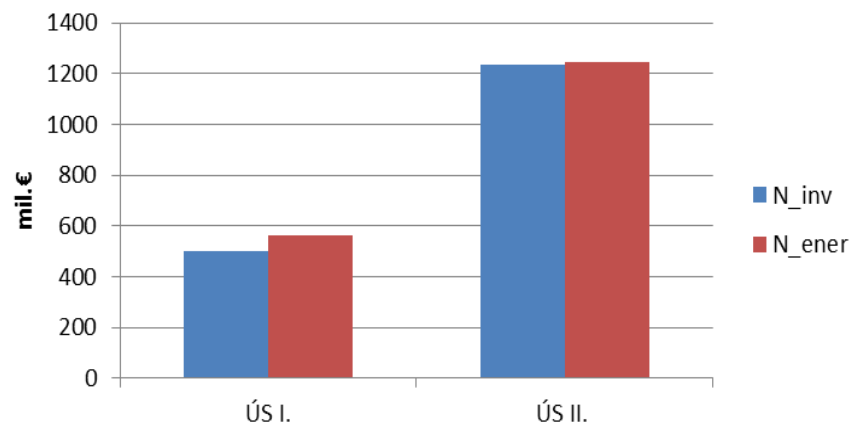


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Celkové investičné náklady a úspory nákladov na energiu do roku 2050 (mil.€)



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