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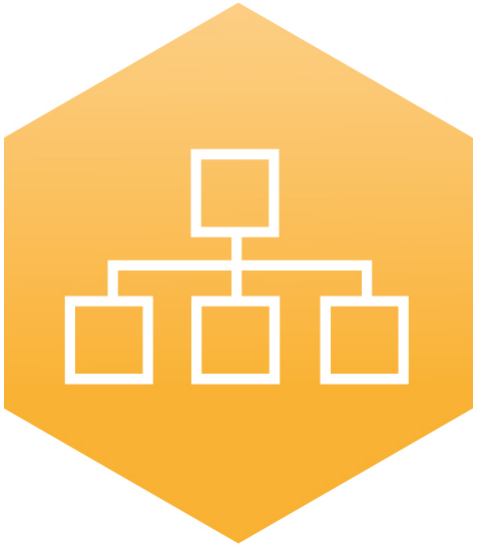
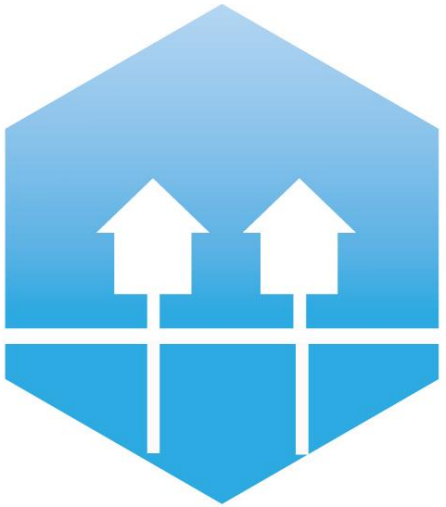
2nd International Conference on Smart Energy Systems and 4th Generation District Heating
Aalborg, 27-28 September 2016

Influence of the capacity of heat storage on identifying an optimal mix of heating technologies using a research centre building in Poland as a case

Marta Kierek, Sebastian Bykuć, Anders N. Andersen,
Poul Alberg Østergaard, Patryk Chaja





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Twinning for a **Su**stainable, **P**roactive **R**esearch partnership in distributed **E**nergy systems planning, **M**odelling and manag**E**ment

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Heat storage in Poland

Source: Mostostal WARSZAWA [website: http://www.mostostal.waw.pl/sustainable-development/research-and-development/news/archive/heat-energy-directly-from-nature]

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Analysis of the optimal mix of heating technologies – does it depend on the capacity of heat storage?

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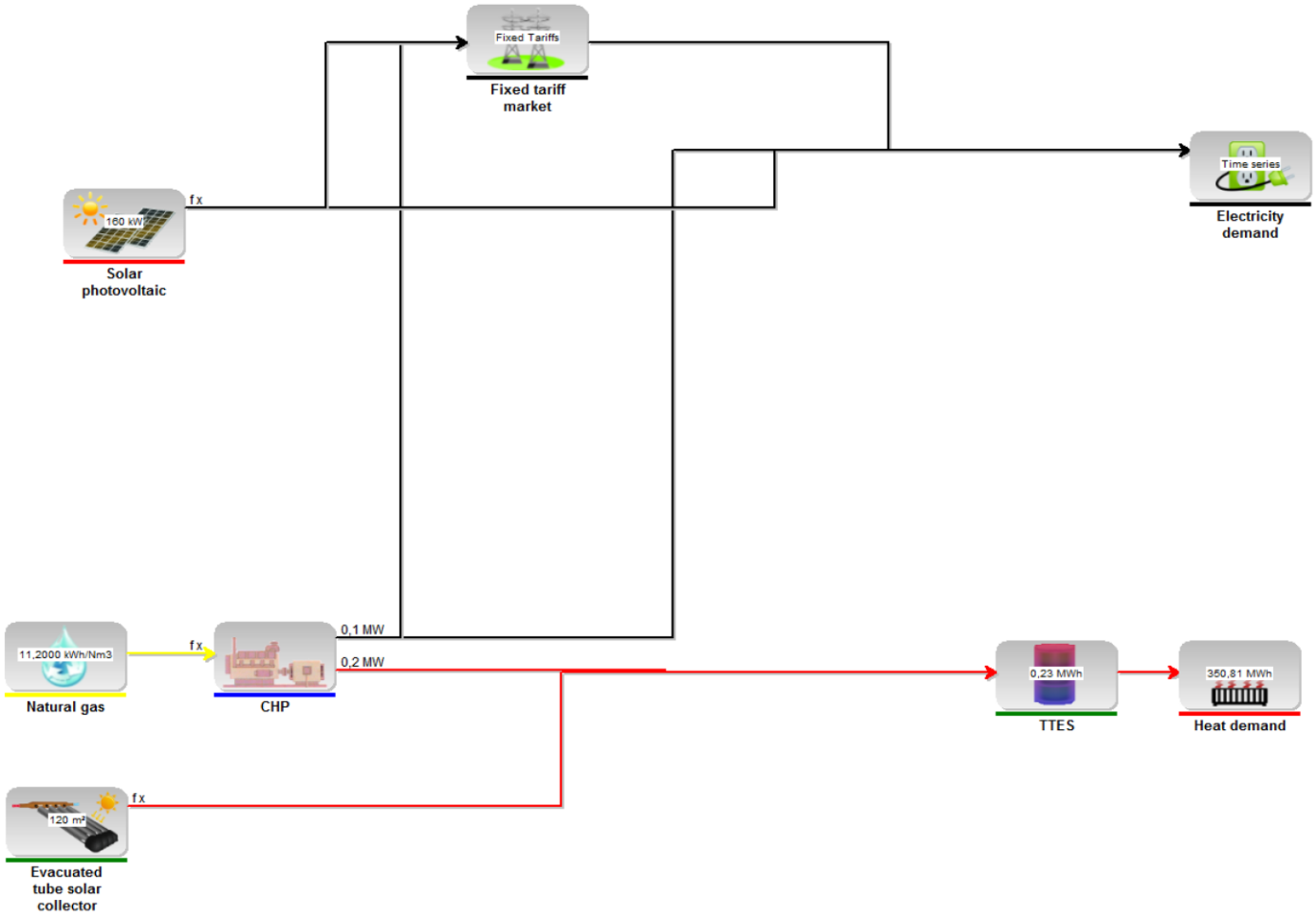

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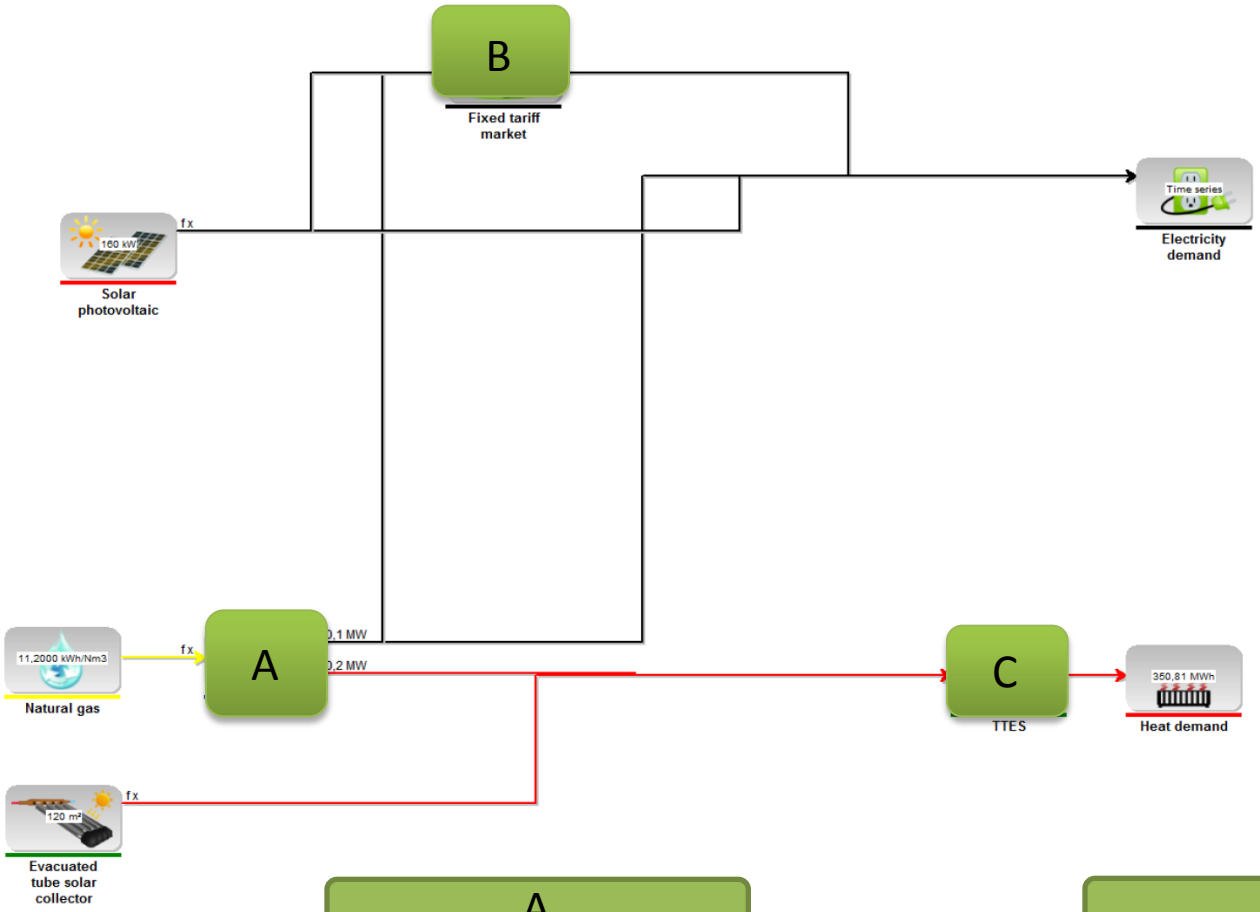

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B

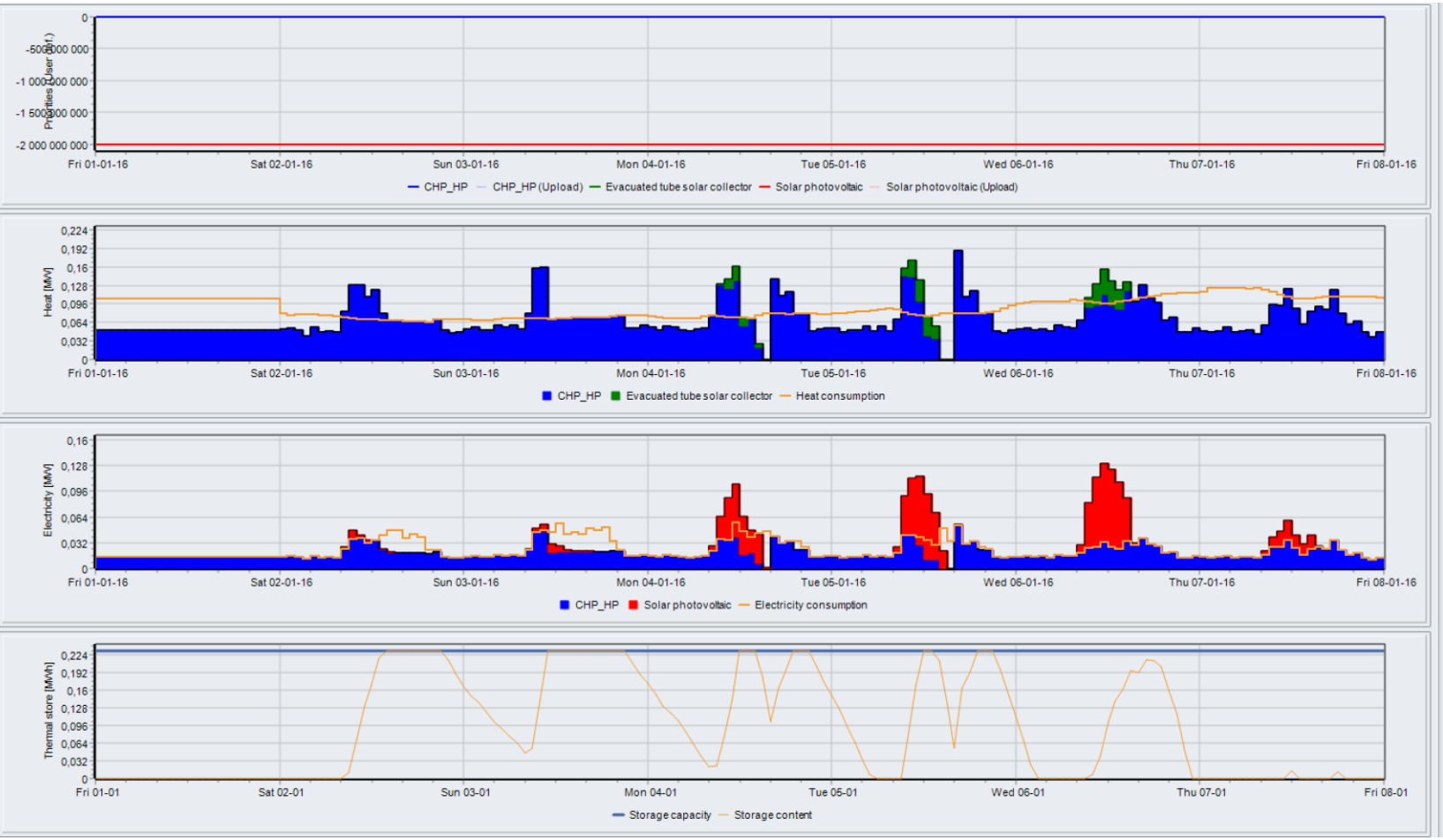
1) Single tariff
2) Double tariff
3) Tripple tariff

A

1) Heat pump
2) CHP + heat pump
3) Biomass boiler
4) Gas boiler
5) CHP

C

1) 5m³ (0,23 MWh)
2) 10m³ (0,46 MWh)
3) 50m³ (2,31 MWh)
4) 500m³ (23,1 MWh)
5) 5000m³ (231 MWh)



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PV + SC + CHP + HP / 5m³ / B23

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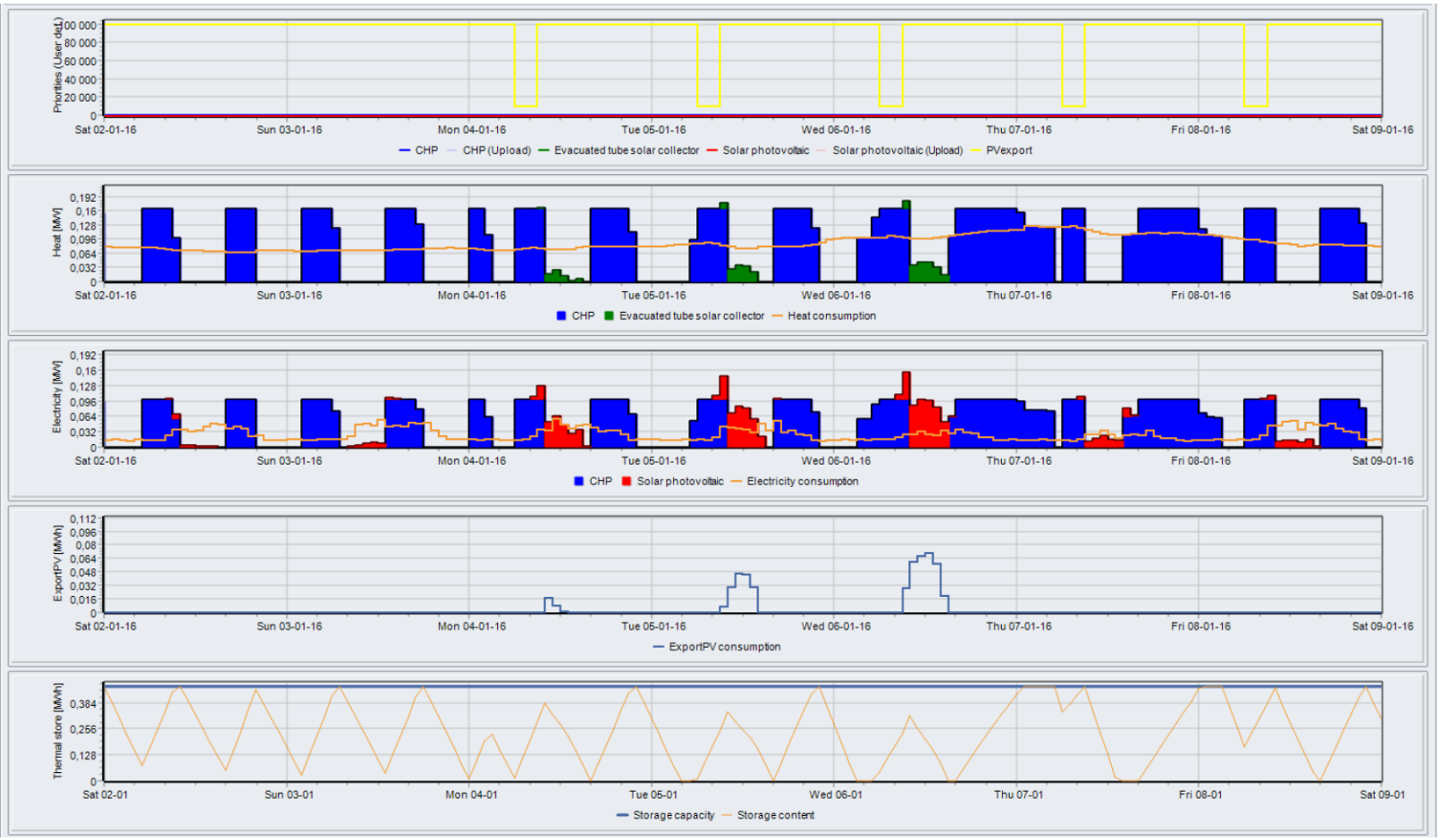

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PV + SC + CHP / 10m³ / B23

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PV + SC + HP / 50m³ / B23

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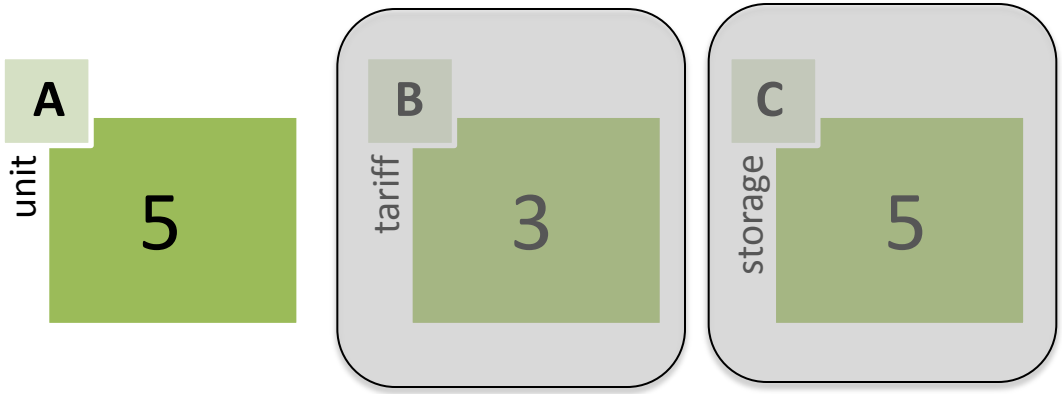

75 different configurations

PV
+
sollar collectors
+
heat pump

Is the electricity price affecting the optimal system?

Price of sold electricity

PV: 465 PLN/MWh (≈108 €)

CHP: 173,89 PLN/MWh (≈40,5 €)

$$\approx 350\ PLN/MWh$$
$$(\approx 81{,}5\ €/MWh)$$

B21	B22	B23
• 543,50 PLN/MWh	• 605,90 PLN/MWh • 501,12 PLN/MWh	• 572,30 PLN/MWh • 666,59 PLN/MWh • 474,72 PLN/MWh

Conlusions

- The best solution for now is: PV + SC + HP
- No influence of the size of heat storage on the optimal mix
- Result is very much dependent on the situation in Poland and is uncertain
- Analysis has to made according to the changes in Poland

Thank you for your attention!

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