

Waste Heat Utilization: Overcoming Barriers in the Czech Republic

Ondřej Vojáček, Jan Brabec, Jan Macháč
Czech Technical University in Prague, Charles University in Prague,
University of J. E. Purkyně in Usti nad Labem
Contact: www.e-academia.eu; ondrej.vojacek@gmail.com

WASTE HEAT

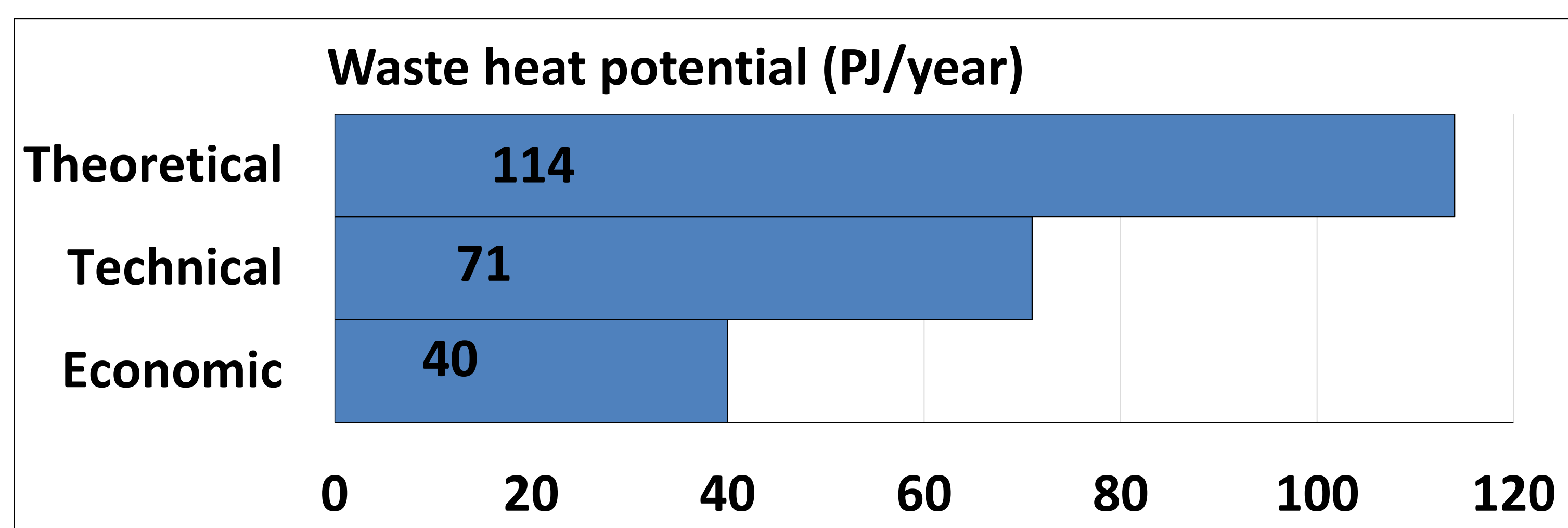
Waste heat is a byproduct of a process that uses energy. Sources of waste heat:

- Power generation (power plants and transport - low efficiency – rest of the energy is lost)
- Industry (e.g., cement works, glass production, data centers)
- Biological (human/animal thermoregulation)

WASTE HEAT POTENTIAL IN THE CZECH REPUBLIC

Waste heat temperature	>140 °C	60-140 °C	<60 °C
Waste heat potential	33 PJ/year	16 PJ/year	65 PJ/year*

- *low potential chemical industry represents 43 PJ – utilization is questionable
- Calculation excludes electricity distribution and transport which is 1/4 of total energy use in the Czech Republic; Source: own analysis



- Theoretical potential = all Czech households connected to central heating system (1.5 million)
- Economically viable potential (estimated at 40 PJ) can supply with heat approx. 800 thousand households.

BARRIERS IN WASTE HEAT UTILIZATION

- High transaction costs of matching supply and demand

- Data about available waste heat are not reported – technological firms do not know where waste heat is produced
- Producers of waste heat are not aware of existing technologies
- Regulatory barriers

INTERREG CENTRAL EUROPE: CE-HEAT PROJECT

- Mapping existing waste heat sources + technological firms that may provide technical solution for waste heat utilization.
- A web portal (www.portalodpadnihotepla.cz) was created to map (a) examples of good practice; (b) unutilized waste heat sources; (c) increase in matching supply and demand through the web portal

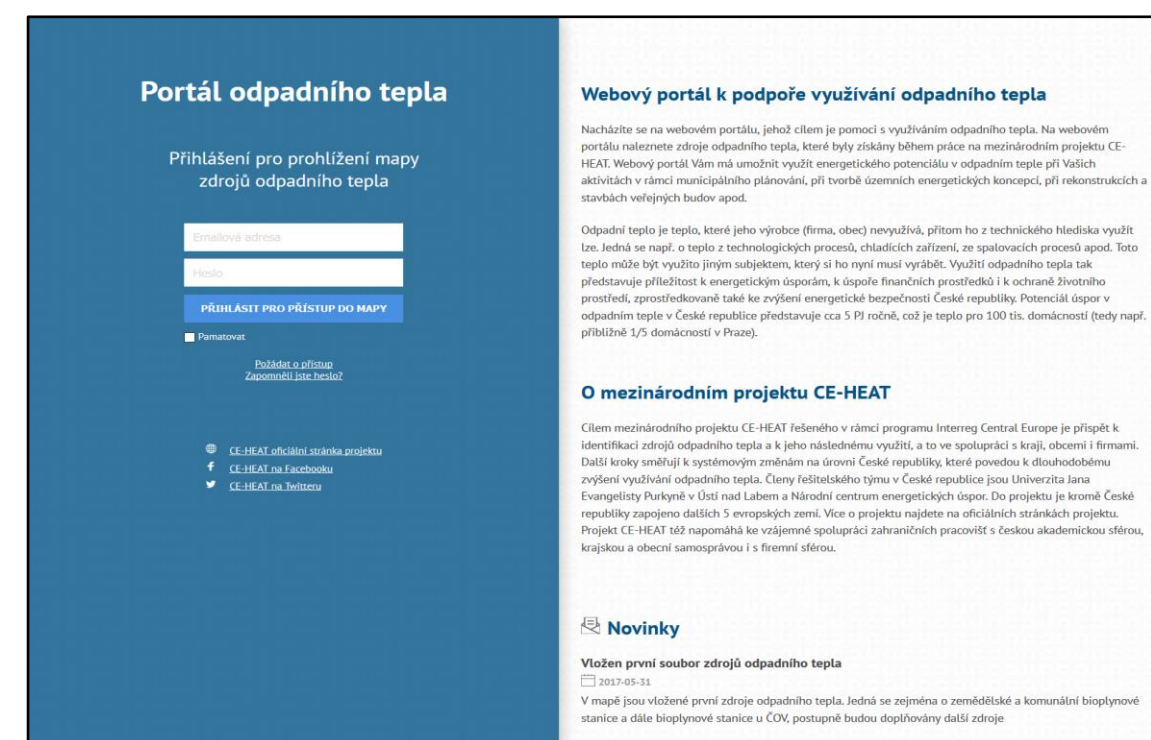
WWW.PORTALODPADNIHOTEPLA.CZ

Feel free to access the portal as our guests:

Username:

conference@portalodpadnihotepla.cz

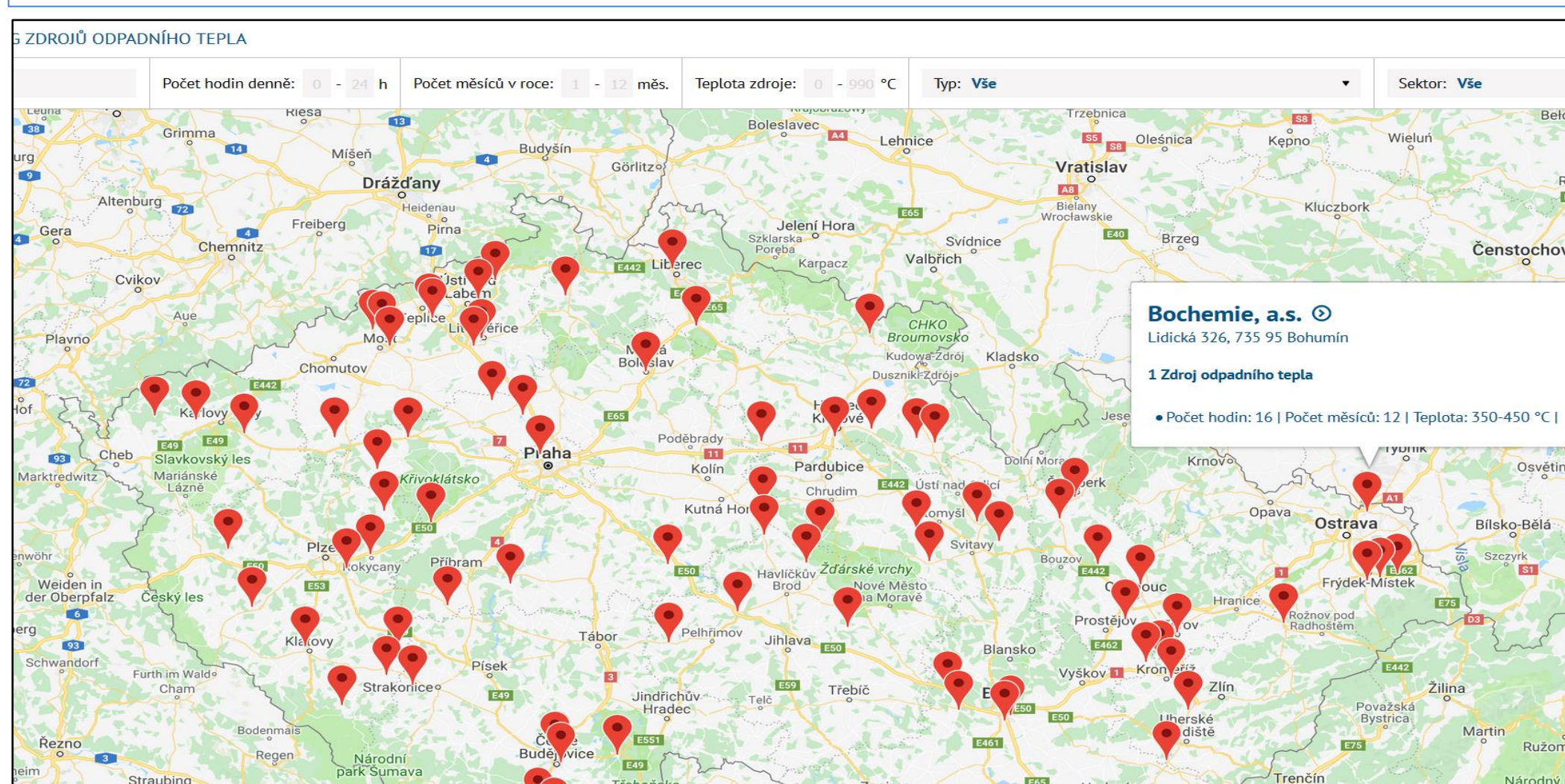
Password: **Conference1**



Firms that produce waste heat can register on the web portal and fill in waste heat parameters as well as information about preferred utilization (e.g, heating, electricity production).

Both examples of good practice and unutilized waste heat sources are displayed on the map.

Summary information is shown after clicking on a specific source. Another click shows parameters in more detail.



Pfeifer Holz S.r.o.	
Zdroj odpadního tepla	
Zdroj 1:	
Adresa:	54101 Chomutov 502, Chomutov, Česko
Počet hodin denně:	24 h
Počet m³ denně:	12 m³
Počet m³ měsíčně:	12 m³
Teplota zdroje:	200-250 °C
Typ:	Teplota ze spalování a dalších odpadních plynů
Sektor:	Zpracování dřeva, výroba dřevotřísk, lepených, pryskyřičných a stavebních výrobků, lepené nádobky
Charakteristika zdroje:	Odpařovací teplo z procesu sušení dřeva
Plánované využití:	Výroba elektrické energie pomocí ORC
Zdroj 2:	
Adresa:	54101 Chomutov 502, Chomutov, Česko
Počet hodin denně:	24 h
Počet m³ denně:	12 m³
Počet m³ měsíčně:	12 m³
Teplota zdroje:	200-250 °C
Typ:	Teplota ze spalování a dalších odpadních plynů
Sektor:	Zpracování dřeva, výroba dřevotřísk, lepených, pryskyřičných a stavebních výrobků, lepené nádobky
Charakteristika zdroje:	Odpařovací teplo z procesu sušení dřeva
Plánované využití:	Výroba elektrické energie pomocí ORC

The waste heat sources can be filtered by:

- Availability during the day (hours), availability during the year (months), temperature, source or sector
- Detailed page presents contact information and specific parameters about one or more waste heat sources at given location.

CASE STUDY – SKŘÍPOV

A case study is being prepared within the **CE-HEAT project**.

Furniture manufacturer produces enough waste heat to provide heating for the whole municipality.

With help of the project the **distribution grid will be modernized and extended** to provide heating for interested households.

FUTURE COOPERATION

We would like to cooperate with:

- Experts who can provide technological solution for waste heat producers
- Companies who produce waste heat and seek the most efficient way of its utilization

Please contact us via above-mentioned e-mail