Industrial Surplus application in China

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Industry → Manufacturing industries → Top 5 Energy-intensive industrial sectors

- In China, energy consumed by manufacturing industries accounts for $\frac{2}{3}$ of the social total energy, compared to the global average $\frac{1}{3}$, the Great Britain $\frac{1}{4}$, and the USA $\frac{1}{5}$.
- Huge amount of waste heat is discharged to the ambient in the industry processing.
Definition of “low-grade” : flue gas below 150 °C, liquid below 100 °C

- 400 °C
- 200 °C
- 100 °C
- 30~40 °C

Temperature

- waste heat power generation
- an increasing percentage in low grade waste heat

Low-grade industrial waste heat has limited application nowadays due to economical inefficiency & technical immaturity.

Waste heat application in the winter is more valuable than that in the summer!
Policies to maximise energy efficiency would improve management of excess heat, including its use for district energy networks in China.
Integration of heating network: Operation parameters

Unifying the surplus heat in different grade to the same temperature of supply water through AHT.

**CHP**
- Extracted steam: 200~300°C
- Exhausted steam: 20~50°C

**Coking plant**
- Cooling water: 20~40°C

**Steel mill**
- Slag-washing Water: 70~80°C
- Cooling water: 20~40°C

**Chemical plant**
- Cooling water: 20~40°C
- Waste gas: 70~130°C

**Cement plant**
- Cooling water: 20~40°C

**Floor heating**
- 40~50°C

**Radiator**
- 45~60°C

**Public buildings**
- 50~60°C

Meeting heat demand in different systems from uniform joint network through AHT.
Case study 2: Steel factory excess heat application

- Industrial waste excess recovery project from Qianxi steel Faction in Hebei province
- Total heating area 10 million m²
- Total investment is around 450 Million RMB;
- Saving 150,000 tce and 1.29 million ton of water per year;
Solution: surplus heat application for District Heating

**Advantages:**

1. “Clean” energy for buildings with no extra emission;
2. Economic benefits due to low operation cost;

**Conclusion:**

Low-grade industrial surplus heat in Northern China in a single heating season amounts to 0.1 billion tce, equivalent to half of the heating demand. It is an important strategic resource to solve the problem of heating source shortage in Northern China. Besides, 3 billion m³ of water per year could be saved.
Thank you!

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