HOW OCP INNOVATIONS DECARBONISE DATA CENTRE FACILITIES?

OCP TECH TALK SERIES:
DATA CENTRE FACILITY

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What is Scope 1, 2 and 3 emissions in data centre?

How can be reduced environmental impact of data centre?

Decarbonisation of OCP ready data centres
WHAT IS SCOPE 1, 2 AND 3 EMISSIONS IN DATA CENTRE?
GHG EMISSIONS IN DATA CENTRE

Scope 1 (On site)

Scope 2 (Energy supply)

Scope 3 (Indirect)
SCOPE 1 (ON SITE)

GenSet
Compressor
refrigerants
Gas boiler
Vehicles
SCOPE 2 (ENERGY SUPPLY)

- Electricity
- Chilled water
- Fuel cells
**WHAT IS THE ENERGY SOURCE IMPACT?**

<table>
<thead>
<tr>
<th>Source of the energy</th>
<th>CO2e emissions per kWh for electric energy</th>
<th>CO2e emissions per kWh for heating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>820 g</td>
<td>330 g</td>
</tr>
<tr>
<td>Natural gas</td>
<td>490 g</td>
<td>245 g</td>
</tr>
<tr>
<td>Nuclear</td>
<td>12 g</td>
<td>4 g</td>
</tr>
<tr>
<td>Wind</td>
<td>11 g</td>
<td>-</td>
</tr>
<tr>
<td>Solar</td>
<td>45 g</td>
<td>-</td>
</tr>
</tbody>
</table>
SCOPE 3 (INDIRECT)

UPSTREAM
- Capital Goods (CG)
- Purchased Goods & Services (PG&S)
- Transportation
- Employee commuting
- Business travel
- Leased assets
- Fuel and energy related
- Waste generation

DOWNSTREAM
- Transportation
- Processing of sold product
- Use of sold product
- End of Live, Treatment of Sold Products
- Leased assets
- Franchises
- Investments
SCOPE 3 (INDIRECT) UPSTREAM

Capital goods (CG)

Purchased Goods & Services (PG&S)

Fuel and energy related
SCOPE 3 (INDIRECT) UPSTREAM

- Waste generation
- Transportation
- Employee commuting
SCOPE 3 (INDIRECT) DOWNSTREAM

End of Live, Treatment of Sold Products

Transportation
HOW CAN BE REDUCED ENVIRONMENTAL IMPACT OF DATA CENTRE?
SCOPE 1 (ON SITE)

- Natural refrigerants
- Liquid heat transfer
SCOPE 2 (ENERGY SUPPLY)

Renewable energy

Sea water
SCOPE 3 (INDIRECT)

Second life servers

OCP prefab racks
DECARBONISATION OF OCP READY DATA CENTRES
DATA CENTRE ENERGY FLOW (INTERNAL AIR CIRCUIT)

Power grid: 1.3 MWh
Servers: 1 MWh
Cooling: 0.3 MWh
Environment: = 1.3 MWh

Cost:
Electricity: 1.3 MWh = 100€/h
Incl. Cooling: 0.3 MWh = 23€/h
ENERGY FLOW FOR HEATING

**Natural Gas**
- 200 m³/h

**Boiler house**
- 0.5 ton CO₂/h

**Useful Heat**
- 1.3 MWh

**Cost**
- Natural gas 200 m³/h = 200-300 €/h
- Emissions 0.5 ton CO₂/h = 60 €/h
CIRCULAR ENERGY FLOW

Power grid

Servers

Cooling & Heating

Useful Heat

1.3 MWh = 1 MWh + 0.3 MWh = 1.3 MWh

Cost reduction

Natural gas 200 m3/h = 200-300€/h
Emissions 0.5 ton CO2/h = 60€/h
OCP READY DATA CENTRES (FRESH AIR FREE COOLING)

- Servers: 1 MWh
- Exhaust Air: 1 MWh
- Environment: 1 MWh
OCP READY DATA CENTRES (FRESH AIR FREE COOLING)

- Servers: 1 MWh
- Exhaust Air: 1 MWh
- Distribution: 1 MWh
- Greenhouse: 1 MWh

Cost reduction:
- Natural gas: 150 m³/h = 150-225€/h
- Emissions: 0.4 ton CO₂/h = 45€/h
THANKS FOR YOUR ATTENTION.

Optimising Data Centres for Heat Reuse & Decarbonisation

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