Norsk Energi’s experience

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ENERGY ENVIRONMENT SAFETY

The effective, environmentally friendly and safe utilisation of energy

Is reducing CO_2 emissions important for you too?

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Norsk Energi

- Industry association established in 1916
- 80 experts with BSc, MSc and PhD
- Consultancy, engineering services, analysis and training
- Independent from equipment suppliers and manufactures
- 90% of turnover from private industry
- 10 % international projects unded by Norwegian government and IFIs

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Norsk Energi's environmental profile

- Environmental advisory
  - New directives, applications for environmental permits
  - Environmental impact assessments
  - Air emissions dispersion models
  - Environmental audits
- Climate mitigation advisory
  - Climate related studies
  - GHG accounting
  - CDM and JI,PIN and PDD
  - GHG emissions factors
  - Black carbon management
  - International climate mitigation, energy efficiency and renewable energy projects

Aker Kværner –use of biofuel for CO2 capture at Kårstø - 15 MW boiler plant

Emissions measurements in Island 2007

Capacity building and development of climate projects in Ukraine

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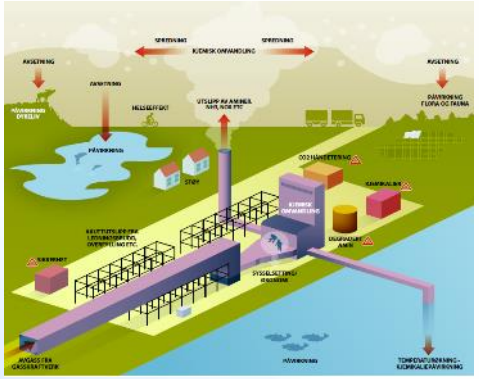
Decarbonisation of air emissions



Carbon Capture and Storage (CCS):

- Technology that according to the IEA may reduce the emissions by 28%
- CO2 can be captured both before and after combustion of fossil fuels by means of membranes
- CO2 can also be captured from both power production and at refineries using nanofiltration.
- Captured CO_2 can be stored in geological formations, in the same way as oil and gas has been stored for millions of years
- Norsk Energi deliveres now research for CO2 capture at Norcem (Cement factory)

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District heating

17 consultants works with district heating projects.

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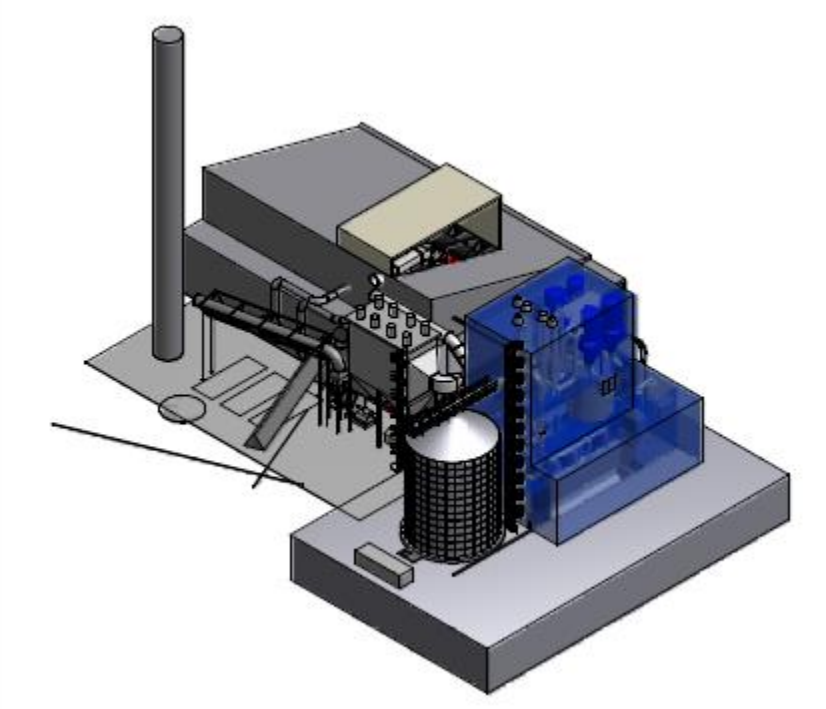
Boiler houses on biomass

100 MW bio oil boiler into the building at Rodeløkka



56 MW wood powder boiler at Haraldrud varmesentral.

Skøyen heat pump central

- District heating central built in the mountain at Skøyen
- Municipal sewerage as heat source

- Total installed capacity: 26,4 MW
  - Pump no. 1: 18,4 MW (biggest in Norway)
  - Pump no. 2: 9,2 MW
- Fully automatic, remote controlled
- Only one operator checks in daily or every second or third day.

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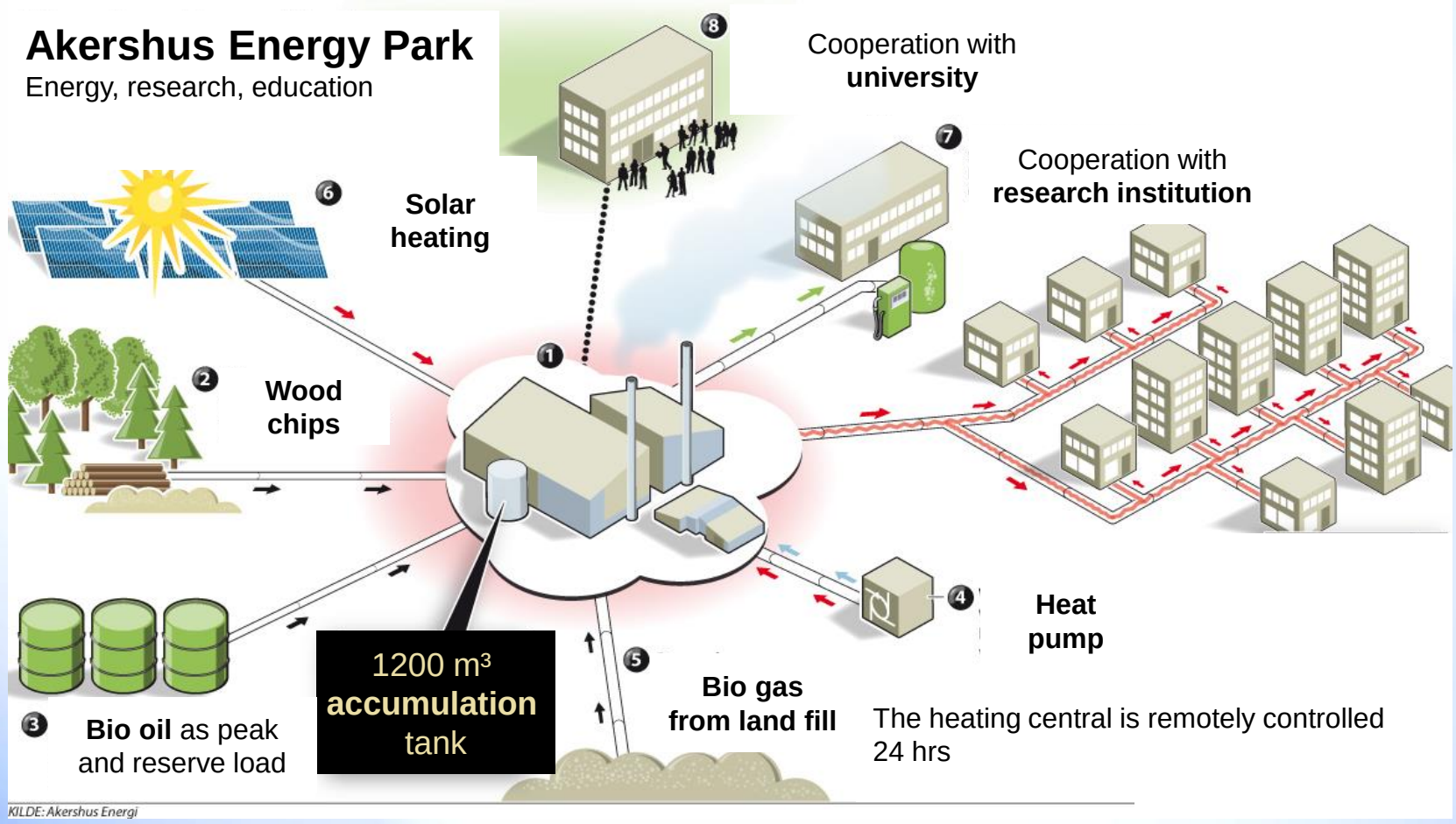
Akerhus Energy park



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Utilization of solar energy in district heating?

Country	First	Oper.	Down
Sweden	1979	22	8
Germany	1993	18	1
Austria	1995	14	2
Greece	1986	14	
Spain	1999	13	
Denmark	1988	10	
The Netherlands	1985	8	
Switzerland	1995	7	
Italy	2002	3	
France	1999	3	
Poland	2004	3	
Others	2000	4	1
Total		**119**	**12**

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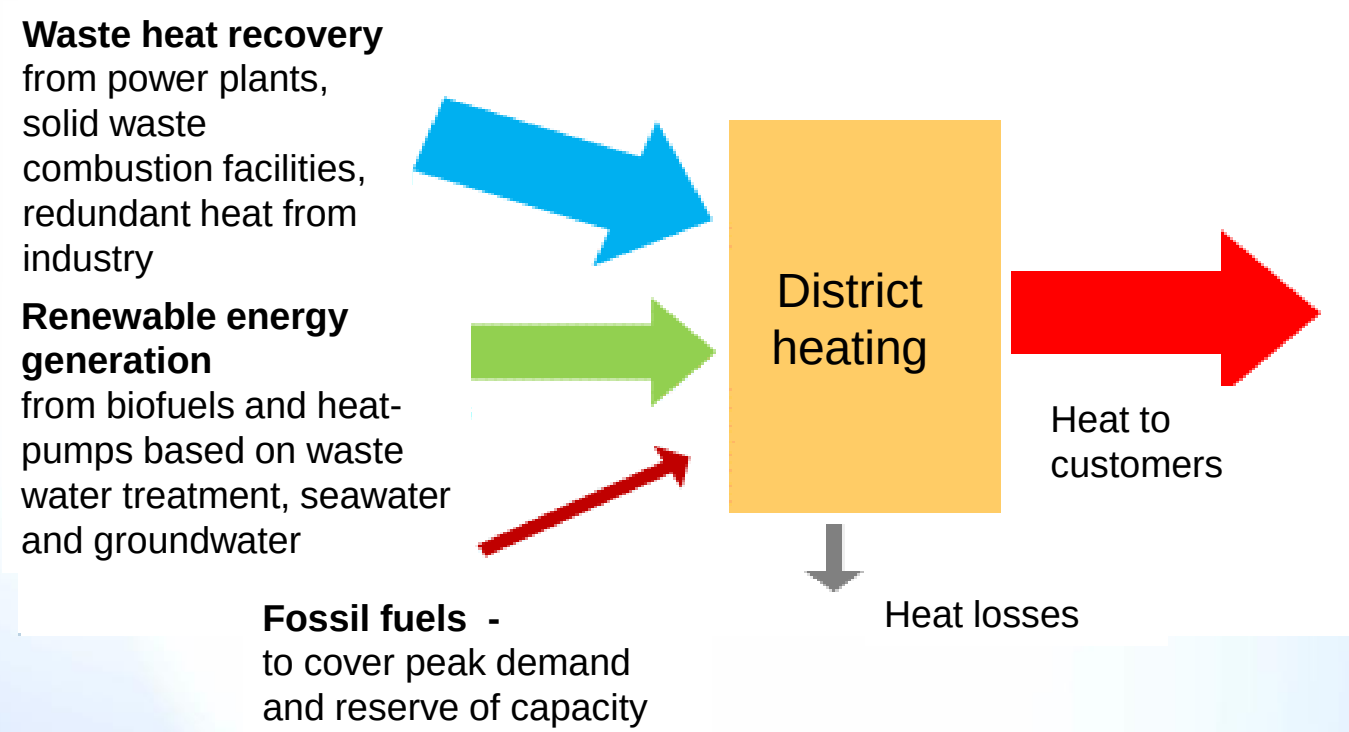
District heating – coming future vision



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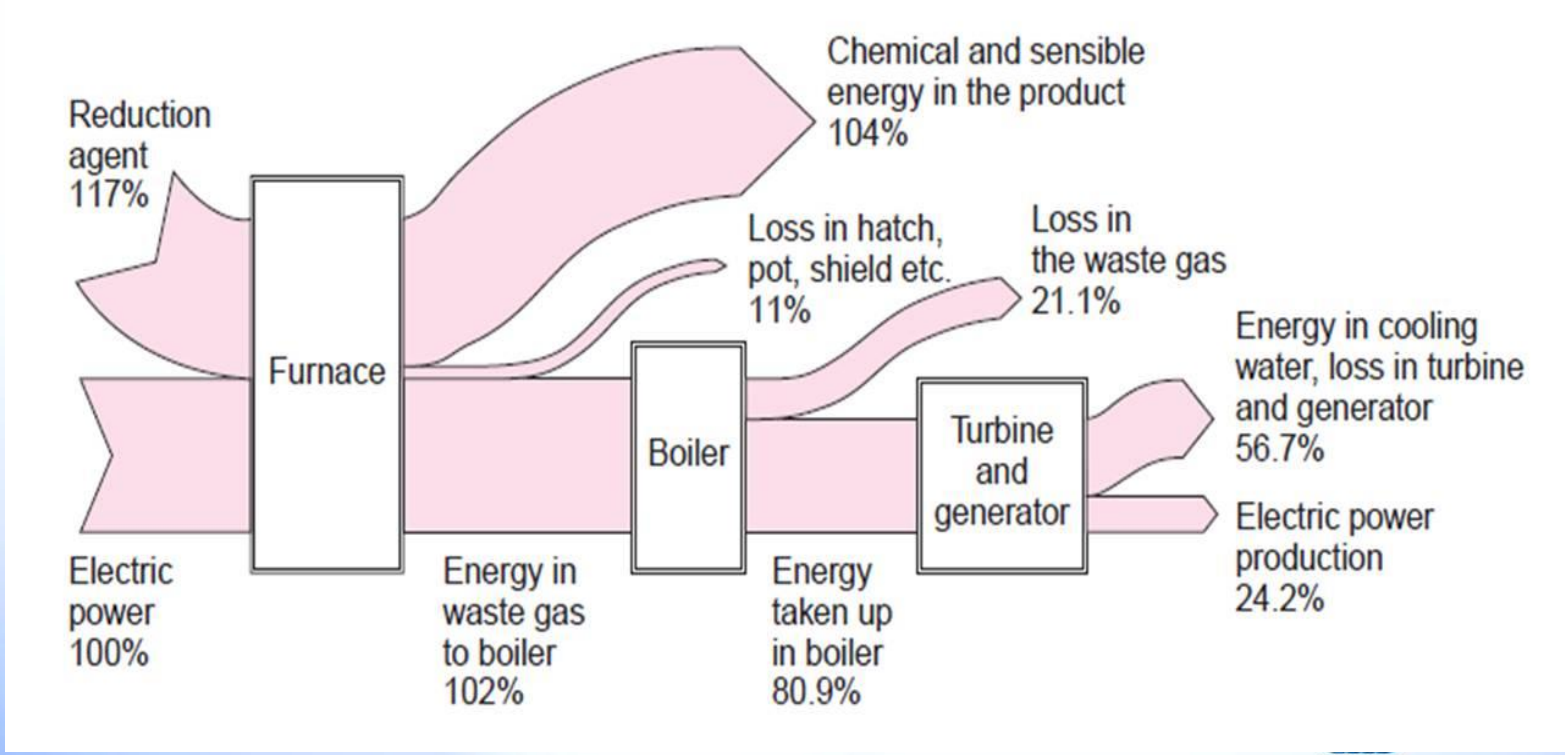
Waste heat recovery from metallurgical furnaces

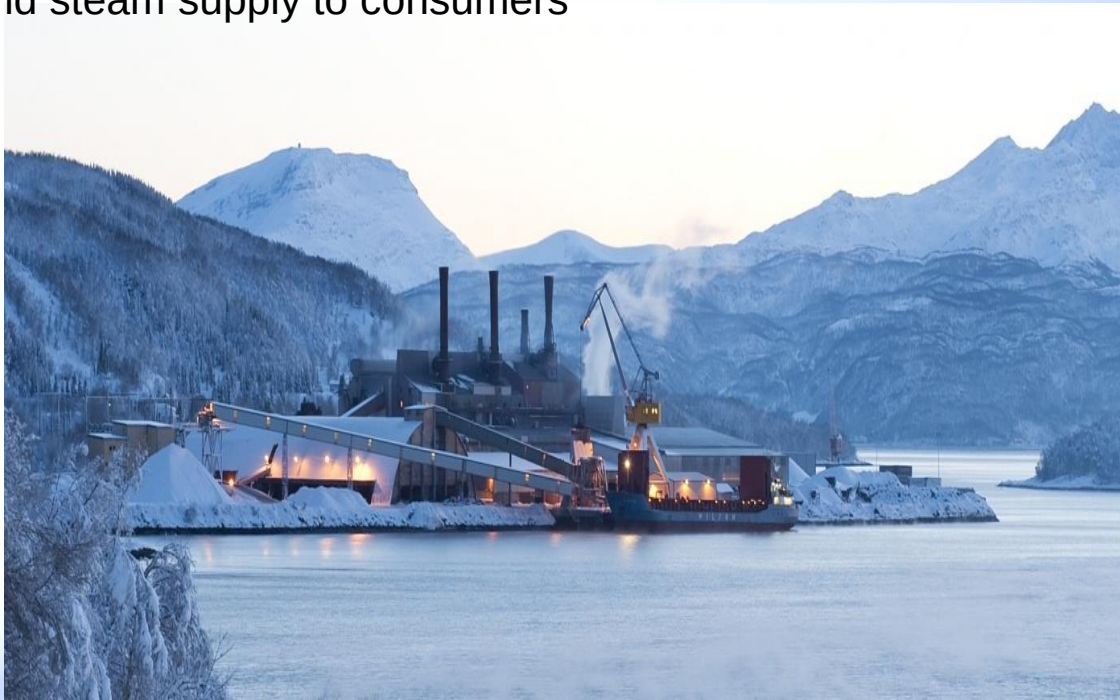


Finnfjord AS – world's largest heat recovery project from FeSi - production

- Ca 100 MW avgasskjel
-Ca 40 MW turbin
-Potensial for 340 GWh elproduksjon

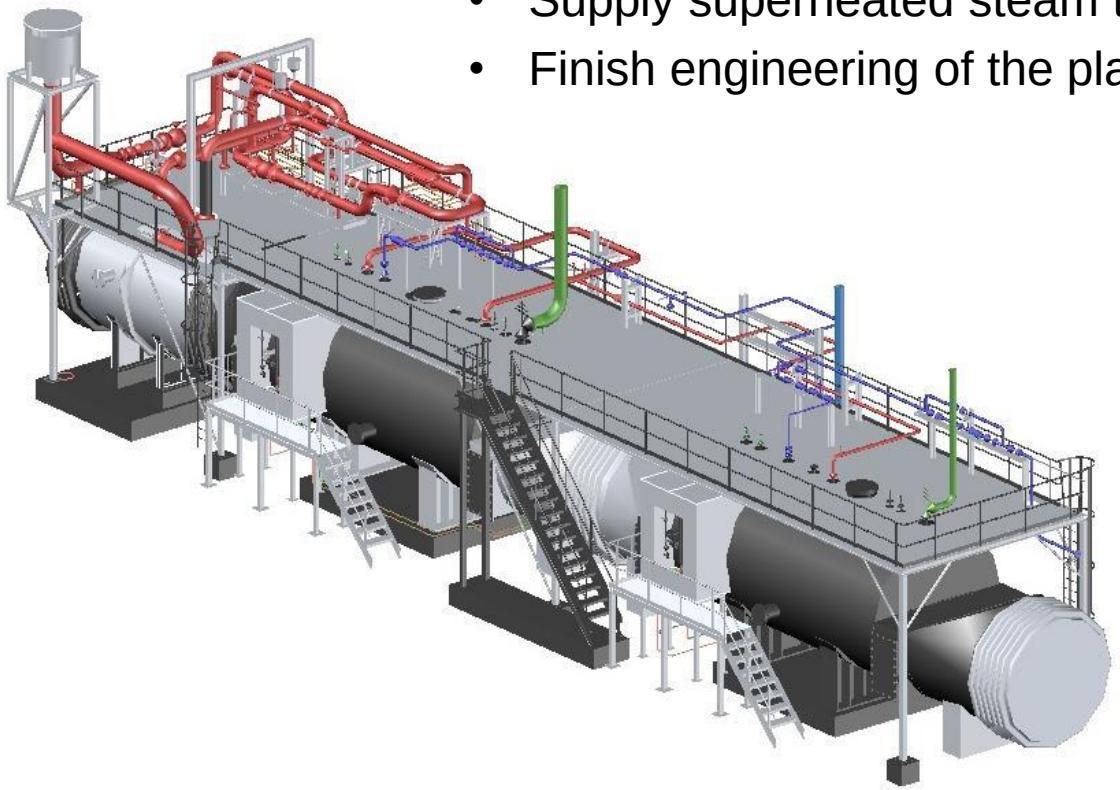
Reference project – Finnfjord, Norway

- Heat recovery from 3 FeSi-furnace
- Use of steam production cooled canals close to the furnace
- 2 boiler for heat recovery the flue gas
- Total heat recovery approximate: 115 MW
- Designed for power production and steam supply to consumers
- Steam turbine size: 40 MW
- Investment 770 mill NOK
- Start up October 2012.



Chemk (Cheljabinsk, Russia)

- Heat recovery from 1 FeSi-furnace
- Smoke tube boiler
- Total heat recovery approximate: 12 MW
- Supply superheated steam to consumers
- Finish engineering of the plant Q4 2012



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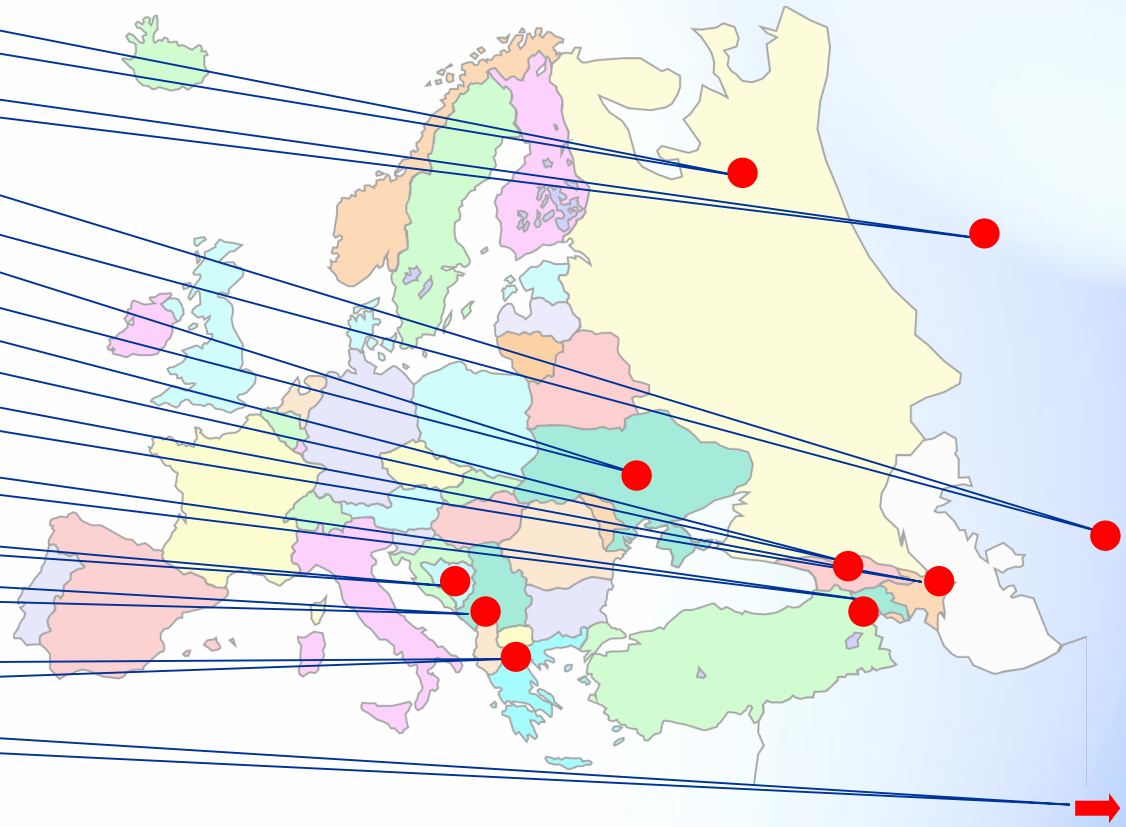
Norsk Energi's International Projects

- NW-Russia bioenergy
- PDD Strezhevoi power plant
- Tadsjikistan small hydropower
- Ukraine EE programme
- Georgia CDM, small hydropower
- Azerbaijan EE building sector
- Armenia CDM, small hydropower
- Bosnia CDM district heating sector
- Serbia, EE projects
- Macedonia IPPC, haz. waste
- China WHR ferroalloy industry
- South Sudan, energy policy advice



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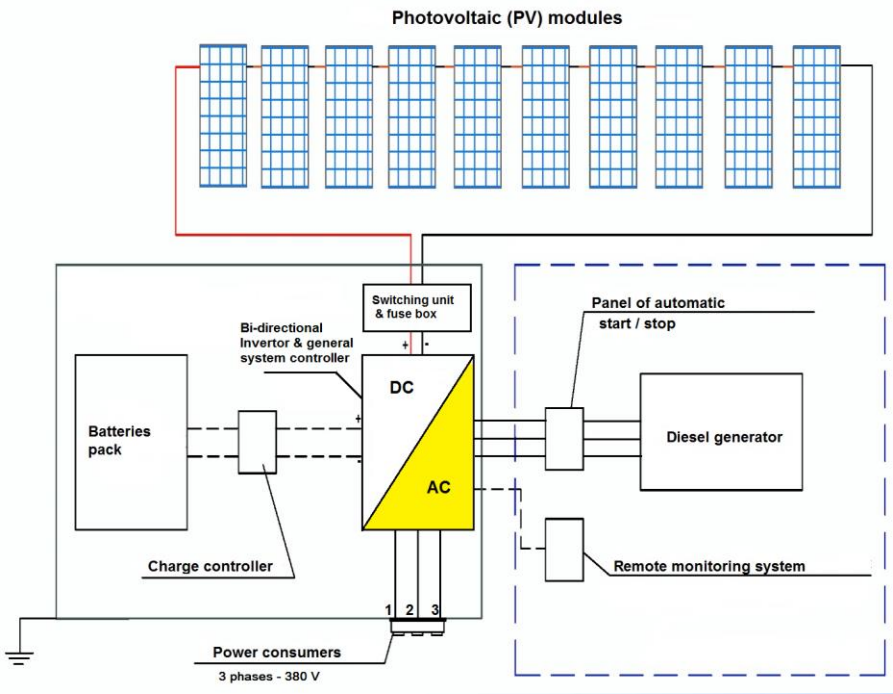
Solar energy for 5 remote settlements in Karelia



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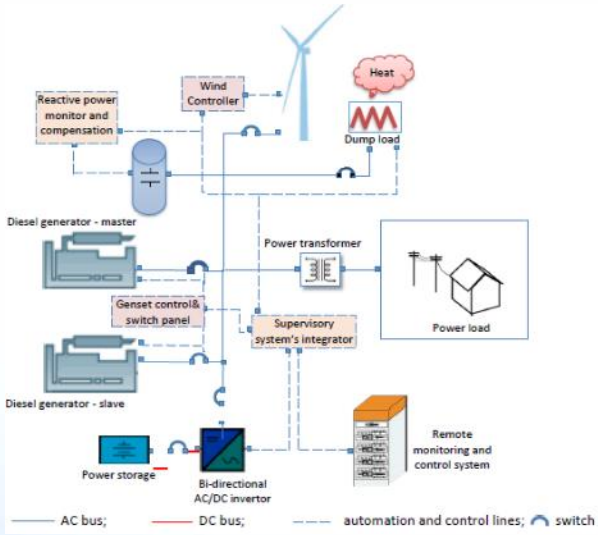
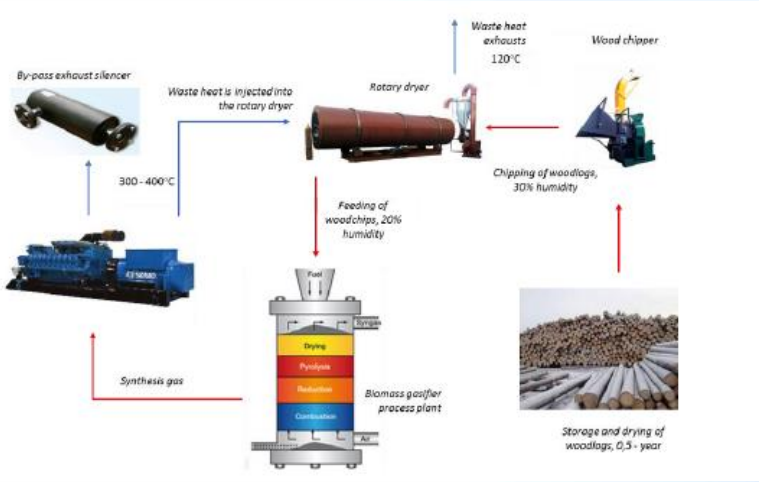
Wind-diesel and biomass gasification – Archanglesk region





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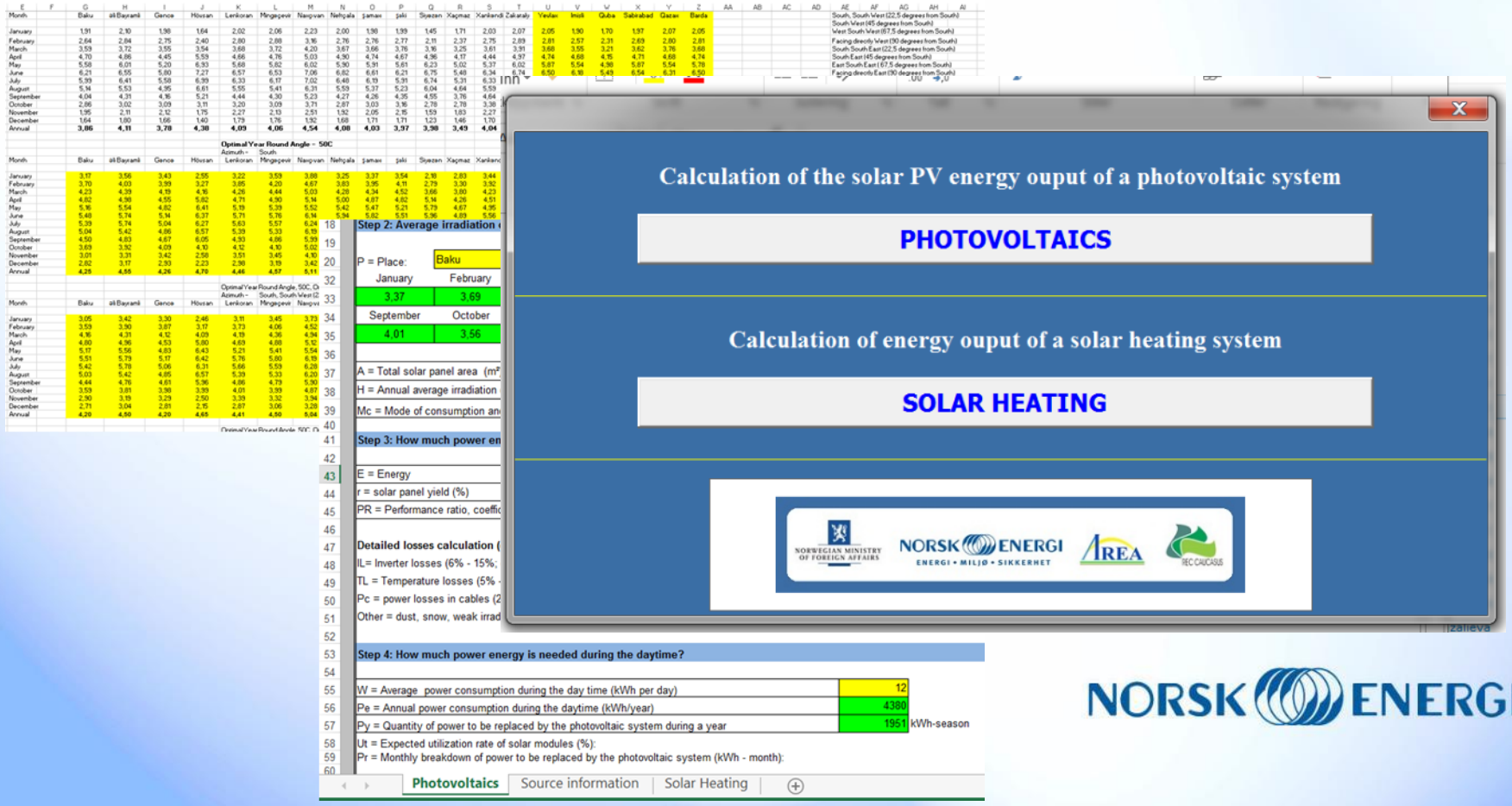
Calculation of solar energy potential

for quick project identification



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Solar calculator – interest in Norway

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Thank you for your attention