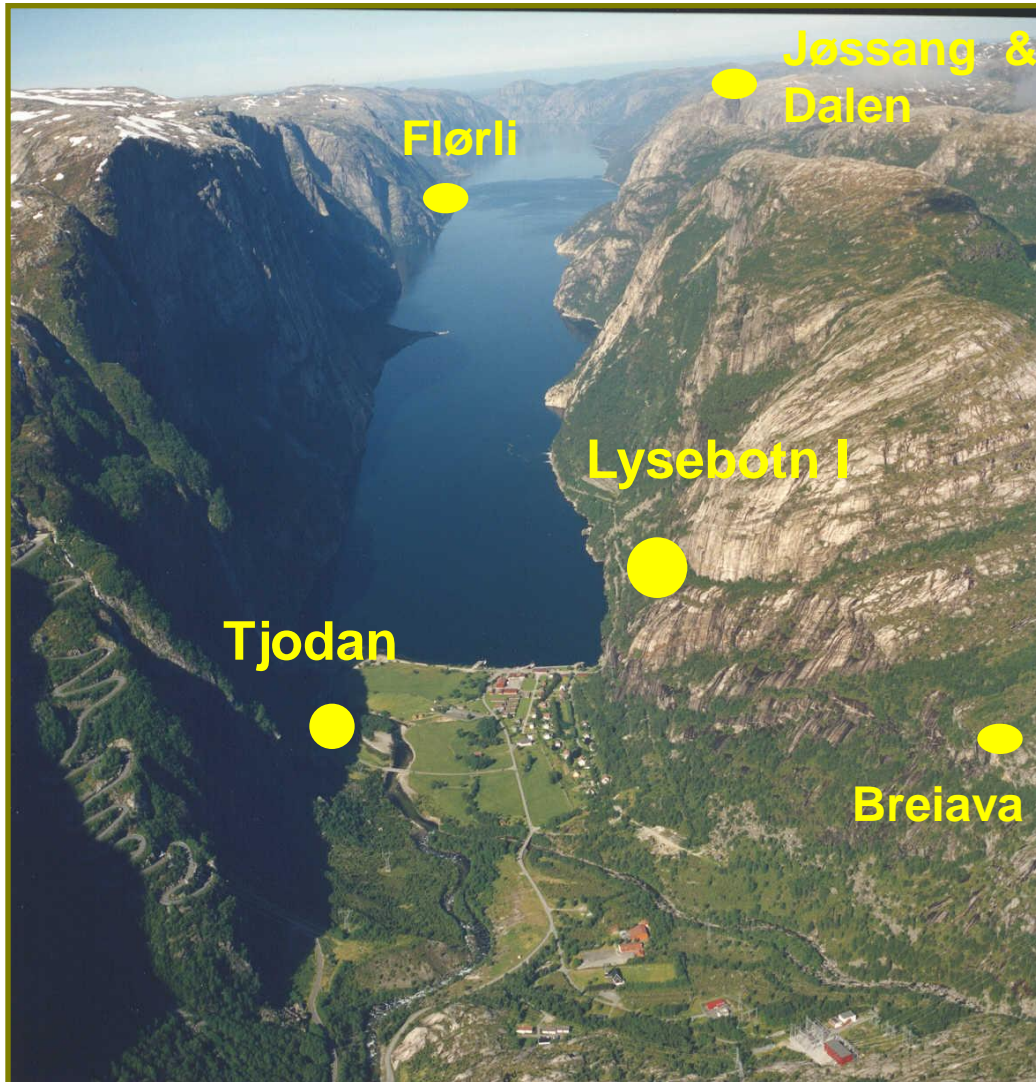


**One Norwegian Example of Environmental  
Friendly and Efficient use of Hydro Power.**

# Lysebotn II



# The Lysefjorden Area



Jøssang&Dalen: Approx.115 GWh

Flørli: Approx. 250 GWh

Tjodan: Approx. 320 GWh

Lysebotn I: Approx.1320 GWh

Breiava: Approx.55 GWh

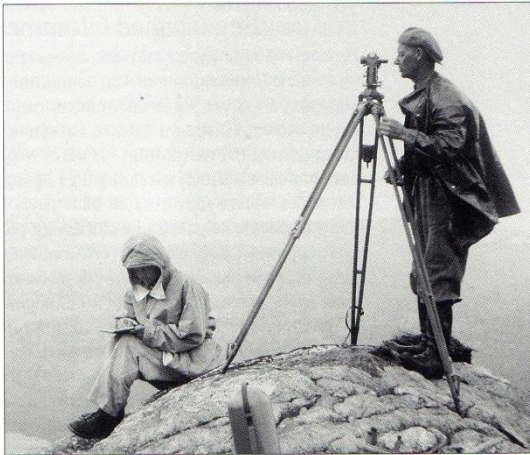




# Lysebotn I – Pioner Work



- Played a very important role in the rebuilding of the Rogaland County the two first decades after the second world war.



- 210 MW – 6 horizontal Pelton
- Gross Head 630 meter
- 1320 GWh/year
- Start Operation 1953-1964
- Catchment Area 316 km<sup>2</sup>
- Reservoir Percent 70 %

# Main Achievements of the New Eletrical Power Plant.



- Increased use of already regulated water => higher efficiency
- Total contribution of approximately 180 GWh renewable hydro power entitle to green certificates
- Increased production to the cost of \$ 0,5/kWh (Marked value about \$1/kWh)
- Expected annual average production approximately 1500 GWh.
- Increased effect from 210 MW til 370 MW => expected hours of operation reduced from +6000 hours today to +4000 hours. => more power may be produced when prices are high.

# Good Environmental Project



- No new waters or rivers are affected
- Very limited environmental Effects
- No need to apply for new consession



# Lysebotn II Power Plant

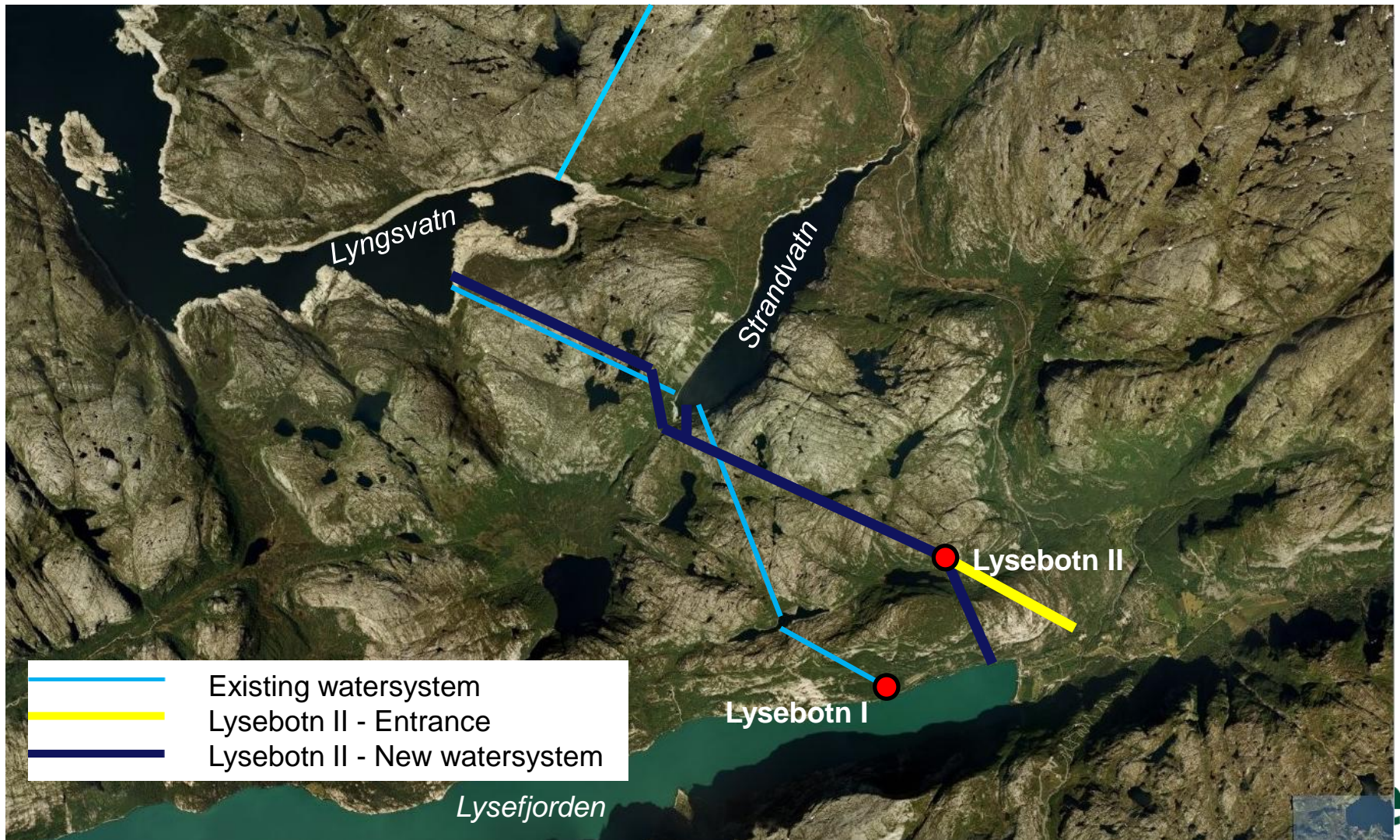


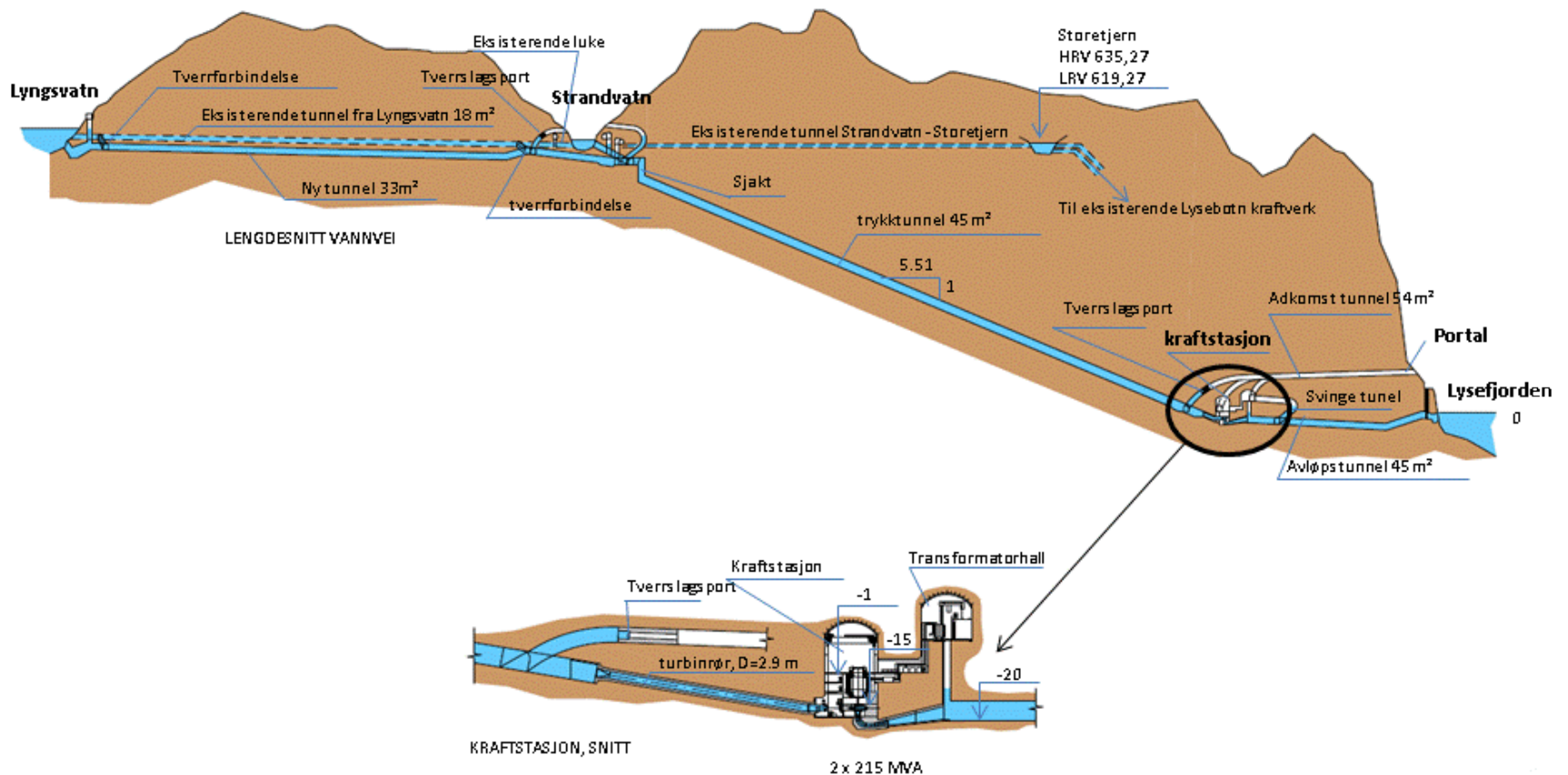
- Increased yearly production from 1320 GWh til 1500 GWh. Todays production is done by 6 Pelton turbines. 3\*30 MW + 3\*40 MW. Totalt effect: 210 MW.
- Lysebotn II: 2 identical highpressure Francis turbines, each with the effect of 185 MW. Total effect: 370 MW.
- Planned production start-up in the spring of 2018.





# Some Details





Lysebotn II Hydro Power Station – Schematikk









Questions ?



Thank You for Your Attention!