

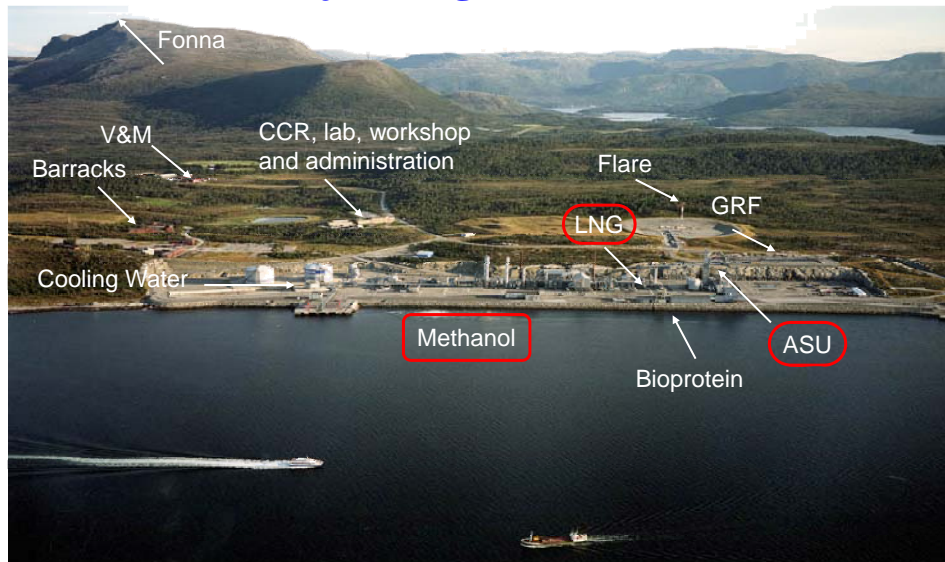
StatoilHydro & MeOH Production – Locations



MeOH 1

StatoilHydro

Tjeldbergodden Site



MeOH 2

StatoilHydro

Tjeldbergodden Industrial Park

- Methanol Production
- Industrial Gases
(Oxygen, Nitrogen, Argon)
- LNG
- (Bioprotein - closed)
- (Steel Prod. – new??)
- Utilizing low grade Heat



MeOH 3

StatoilHydro

The Methanol Plant



MeOH 4

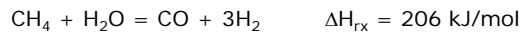
StatoilHydro

Secondary Reformer

- **Combustion:**



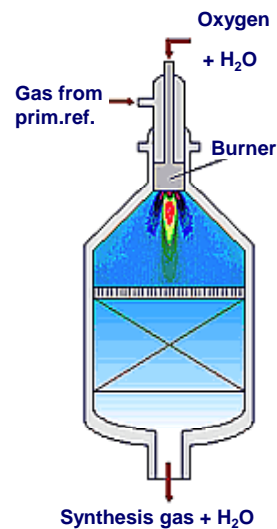
- **Reforming and Water Gas Shift:**



- **Energy:**

Heat is recovered in a Waste Heat Boiler (Steam)

- **Catalysts:**

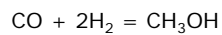


MeOH 5

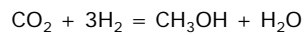
StatoilHydro

Methanol Synthesis

- **Chemical Reactions:**



$$\Delta H_{rx} = ?? \text{ kJ/mol}$$



$$\Delta H_{rx} = ?? \text{ kJ/mol}$$

- **Heat of Formation Data:**

$$\text{CO} \quad : \quad \Delta H_f^0 = -111 \text{ kJ/mol}$$

$$\text{CO}_2 \quad : \quad \Delta H_f^0 = -393 \text{ kJ/mol}$$

$$\text{H}_2 \quad : \quad \Delta H_f^0 = 0 \text{ kJ/mol}$$

$$\text{CH}_3\text{OH} \quad : \quad \Delta H_f^0 = -201 \text{ kJ/mol}$$

$$\text{H}_2\text{O} \quad : \quad \Delta H_f^0 = -242 \text{ kJ/mol}$$



Answer: -90 kJ/mol and -50 kJ/mol ⇒ Exothermic Reaction

MeOH 6

StatoilHydro

Distillation Section with 3 Columns

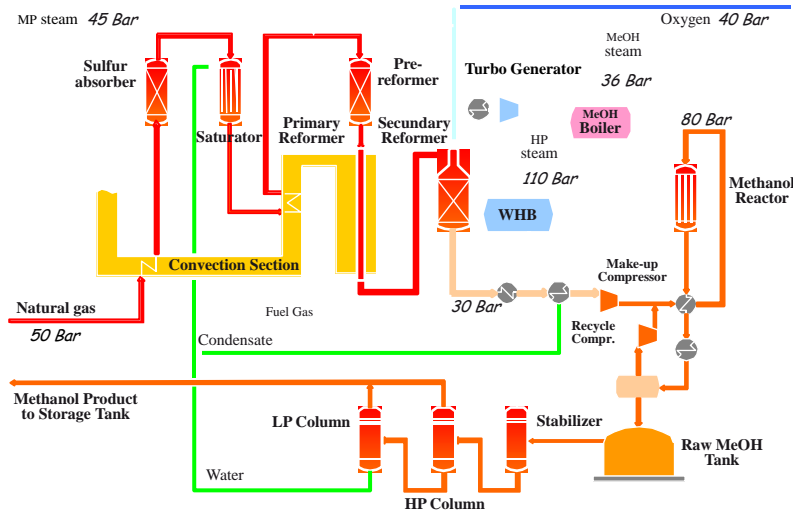
- **Stabilizer:**
Removes lighter Components in raw Methanol before Distillation
- **HP Column:**
45 % of the Distillation
- **LP Column:**
Completes the Purification



MeOH 7

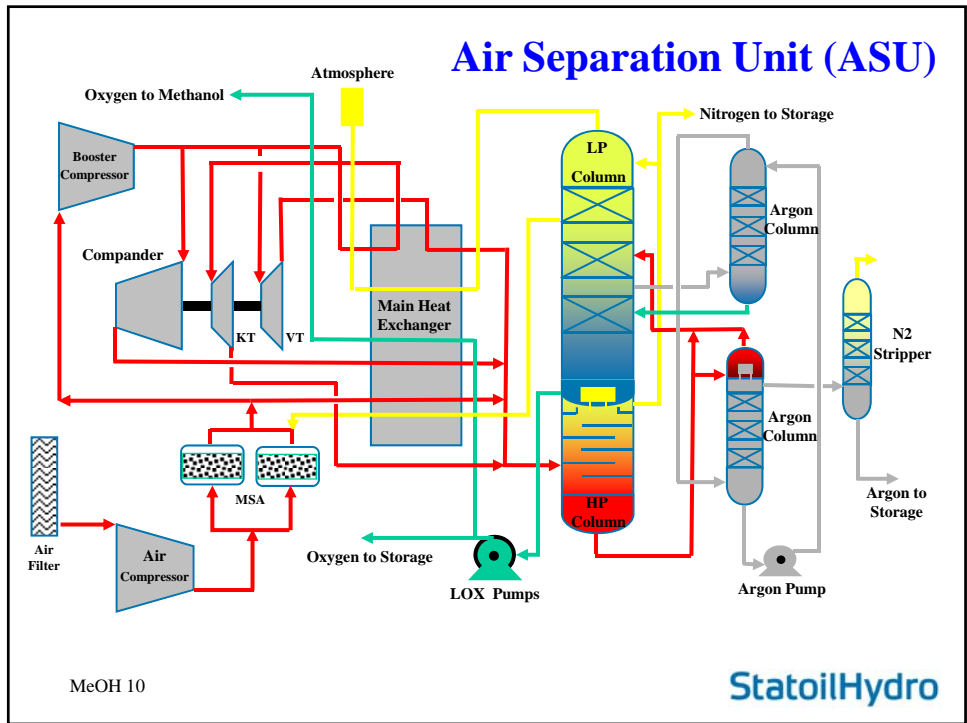
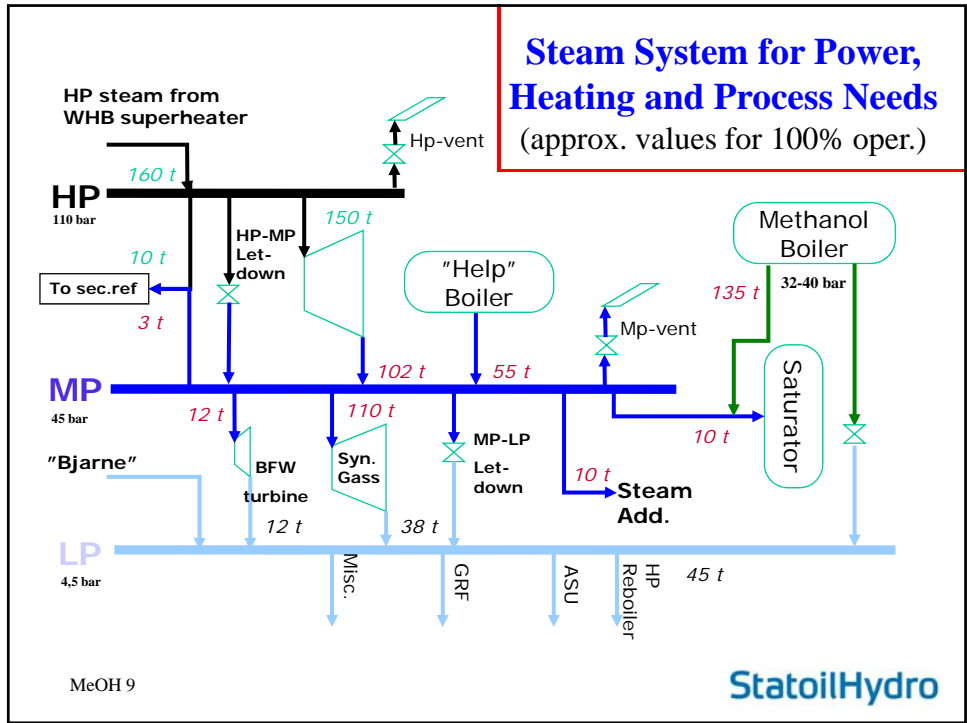
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Flowsheet for MeOH Process

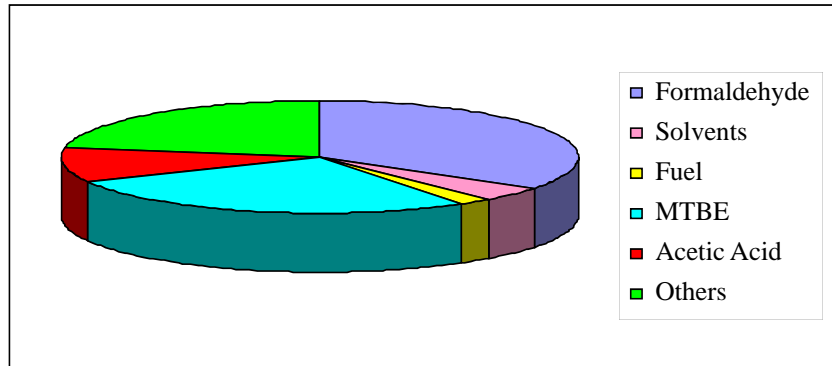


MeOH 8

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The Methanol Market (2006)



MeOH 11

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