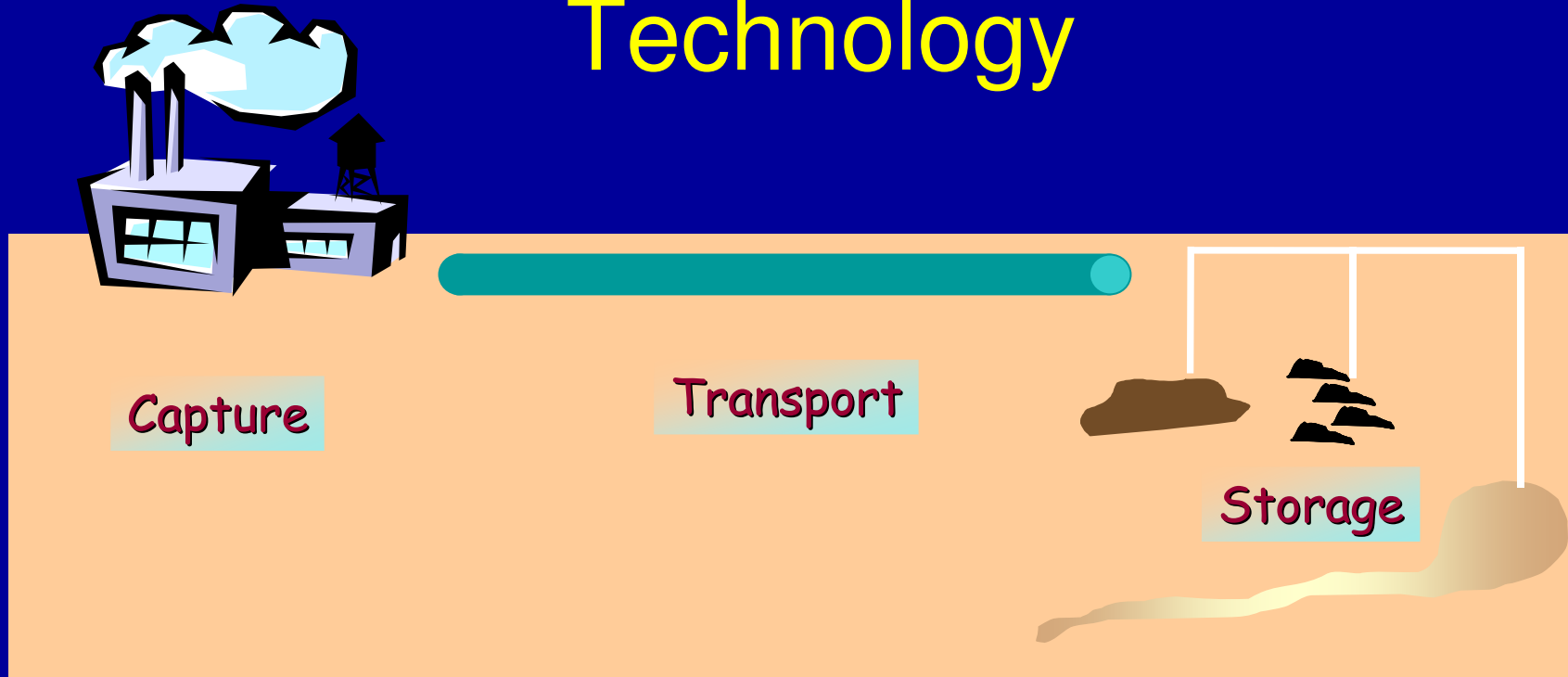


What next ? Technology



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- **Capture:**
 - Is it a real gap ?
 - No, it exists, BUT it must be improved as much as possible
 - Capture ready ? Yes but ...

Thermodynamics

Minimum theoretical gas separation work :

$$- n R T \sum (n_i / n) \ln (n_i / n)$$

CO₂ separation from a mixture, at mole concentration x

$$= 288 * 8.31 * (x * \ln (x) + (1-x) * \ln (1-x)) / x$$

| | kJ/Kmol | kJ/kg | kWh/kg | €/ton |
|---------------|---------|-------|--------|-------|
| At 375 ppmv : | 21000 | 490 | 0.135 | 4 |
| At 3% : | 10800 | 244 | 0.067 | 2.0 |
| At 10% : | 5800 | 177 | 0.050 | 1.47 |

Assuming 1 kWh at 0.03€

(comparison : MEA at 4 GJ/t CO₂)

- **Storage:**
 - Storage ready is crucial (specially deep saline aquifers) !
 - A simple question: "How can we qualify underground storage with long-term efficiency and safety ?"
 - Second question: "When ?"

**This is a real challenge ... and we
have to start NOW !**