



WP5 - Transport

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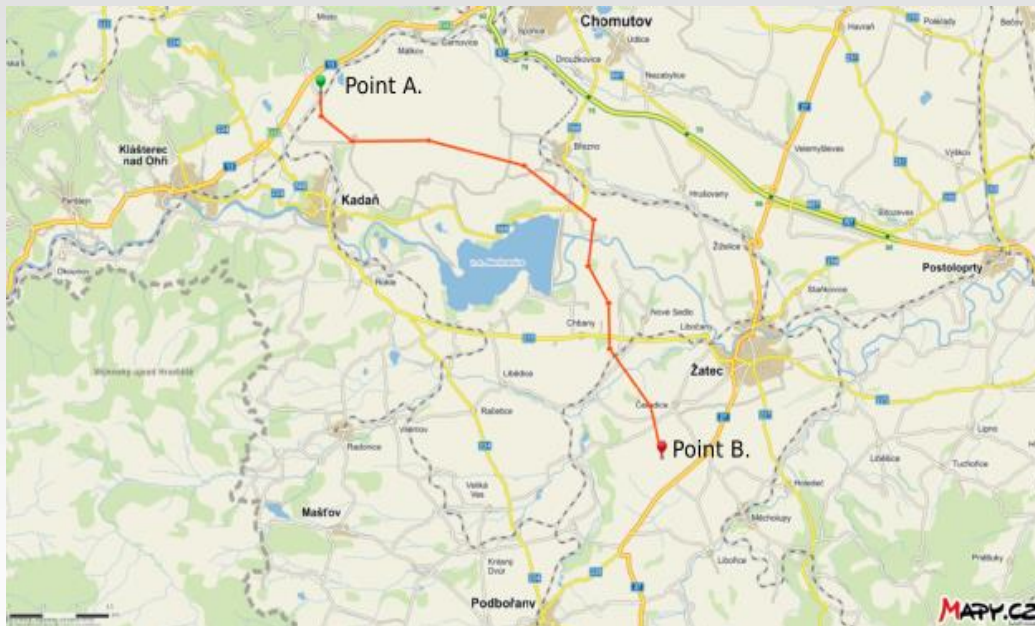
Introduction

- Base case:
 - 250 MWe power block - Prunéřov
 - Production of CO₂ 190 t/hour (≈ 1.6 MTPA)
- Localization of place for storage:
 - Considered location – Zatec
 - Storage capacity – 450 Mt
- Type of transport:
 - Pipeline
 - Railways



Transport via pipeline

- The length of transport routes – 25 km (approximate value)
 - positive - the most economical method of transporting large quantities
 - negative – new pipeline



- Parameters for transport:
 - 15 MPa
 - 40 °C

Outcome from analysis



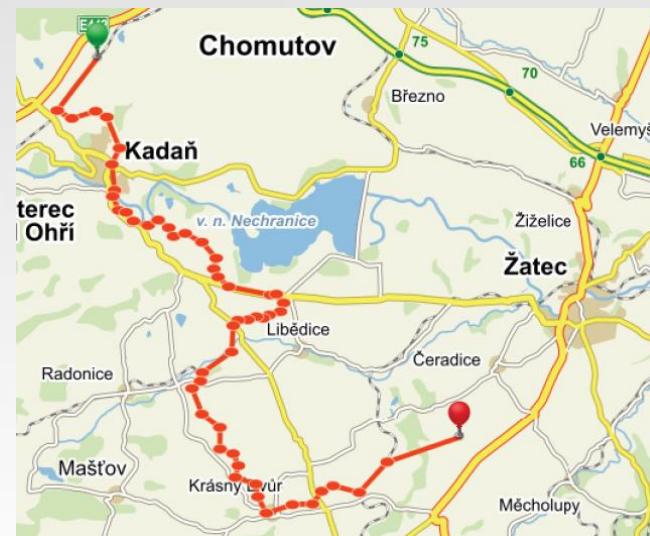
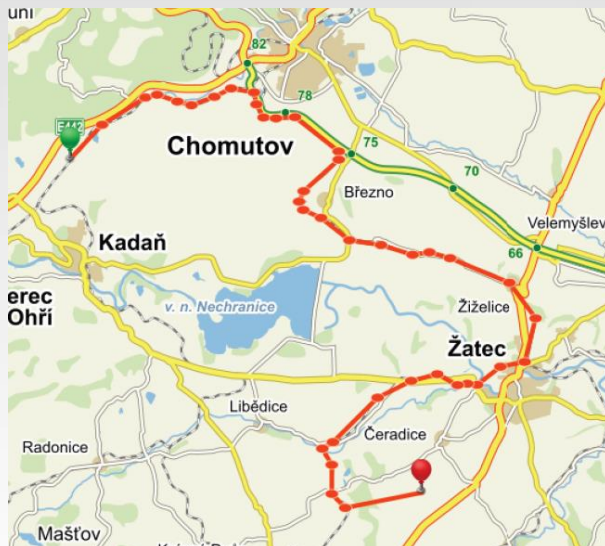
Transport via railway

- Transport liquid CO₂
 - positive - built railways in region
 - negative - blockage of railways
- Parameters of a tank:
 - 2.6 MPa
 - 60 tonnes

Outcome from analysis

• Track – 48 km

• Track – 39 km



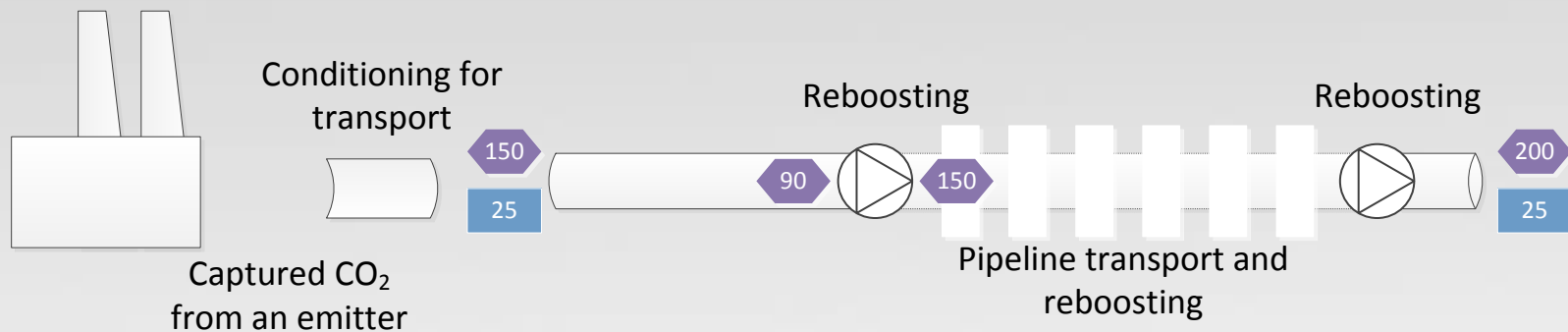


Methodology

- Techno Economical analysis including:
 - Capital and operational cost of the "conditioning before transport" and the transport itself
- Investigation will consider the effects of on cost and operability for pure CO₂ and the CO₂ with residual components from the capture process




CASE 1: Pipeline transport of CO₂



Legend:

 Pressure (bar)

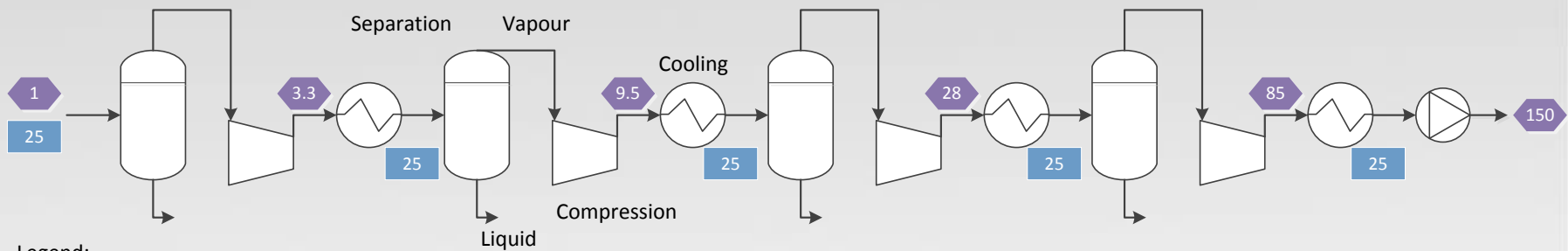
 Temperature (°C)



Pipeline transport - conditioning

Feed after capture

To pipeline



Legend:

P Pressure (bar)

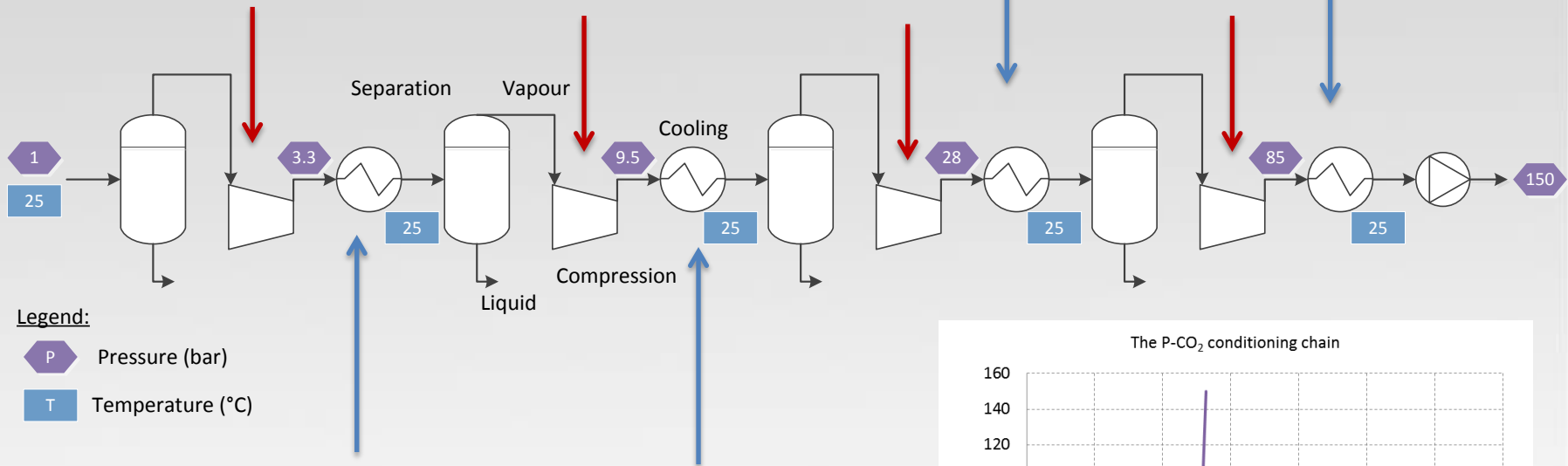
T Temperature (°C)



Pipeline transport - conditioning

Feed after capture

To pipeline

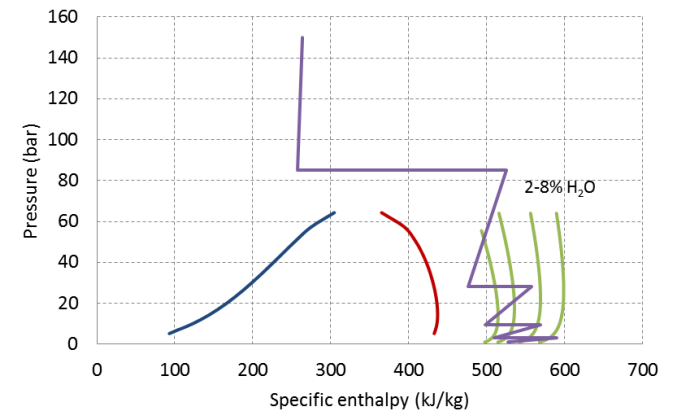


Legend:

P Pressure (bar)

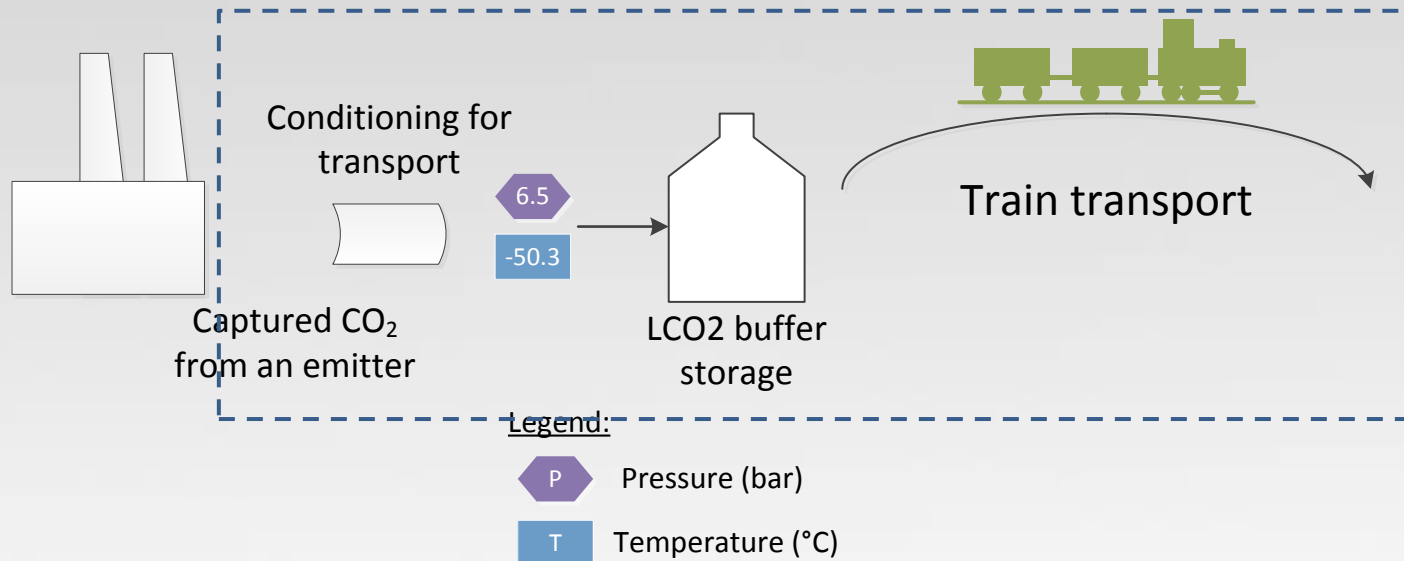
T Temperature (°C)

The P-CO₂ conditioning chain





CASE 2: Transport by train

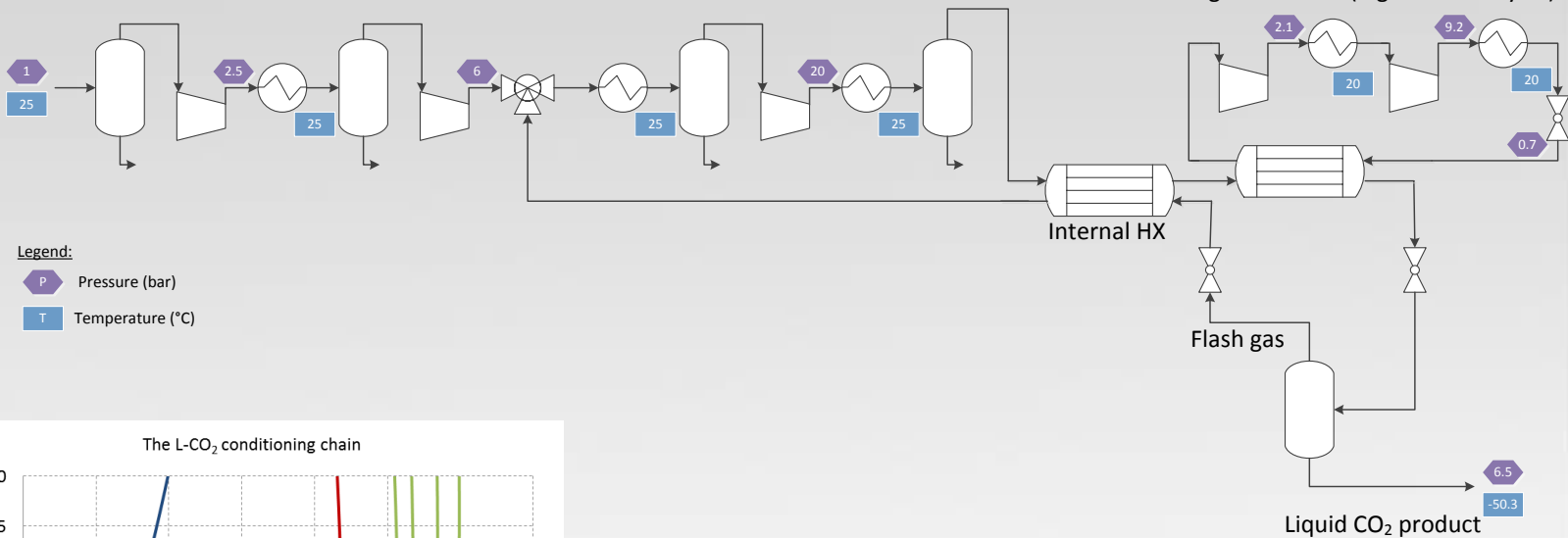




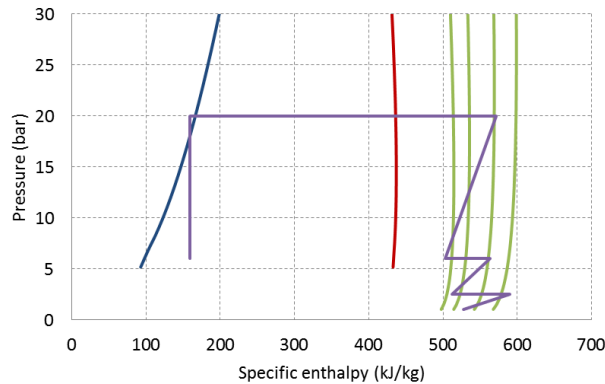
CASE 2: Transport by train

Separation, Compression and Cooling (3 stages)

Feed stream from capture process



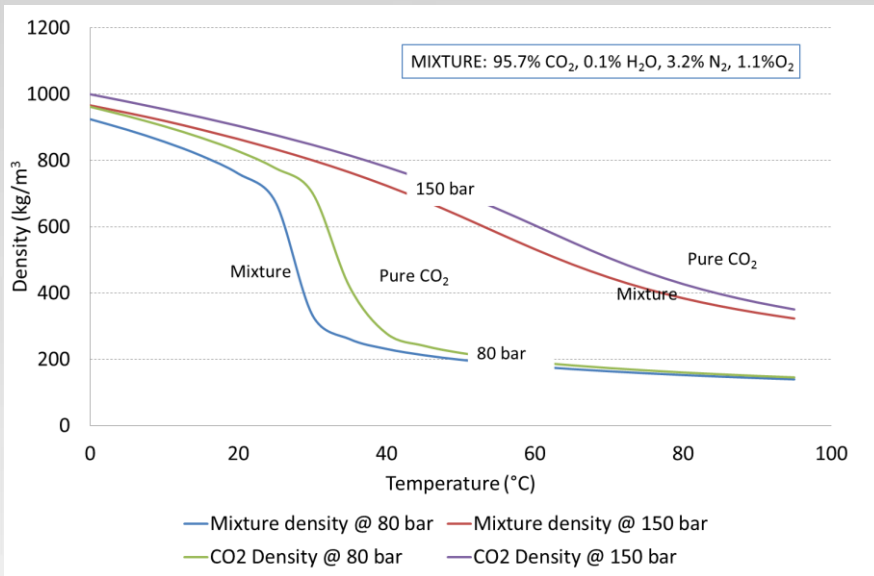
The L-CO₂ conditioning chain



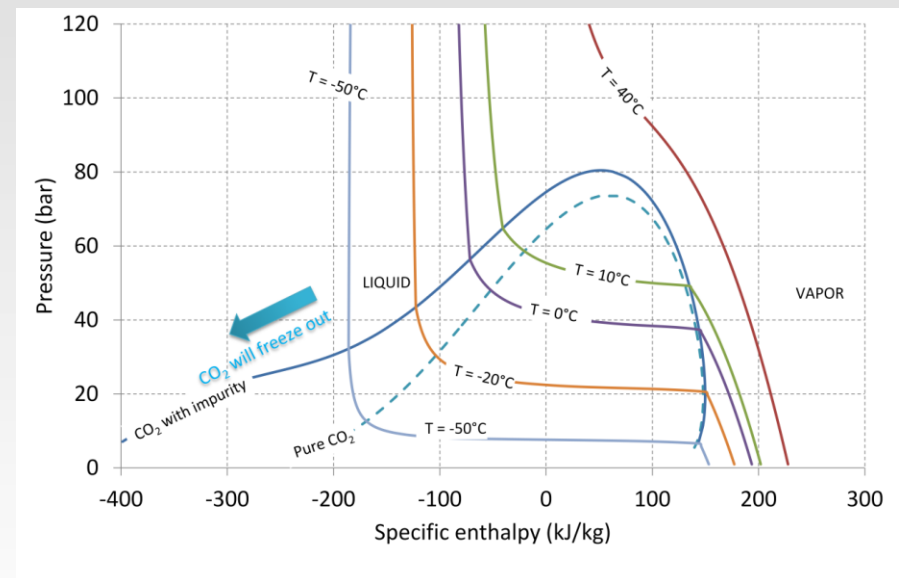
Effect of impurities relevant for transport cost and equipment design



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Density



Phase behaviour