
Engie's Vision on H2 Economy

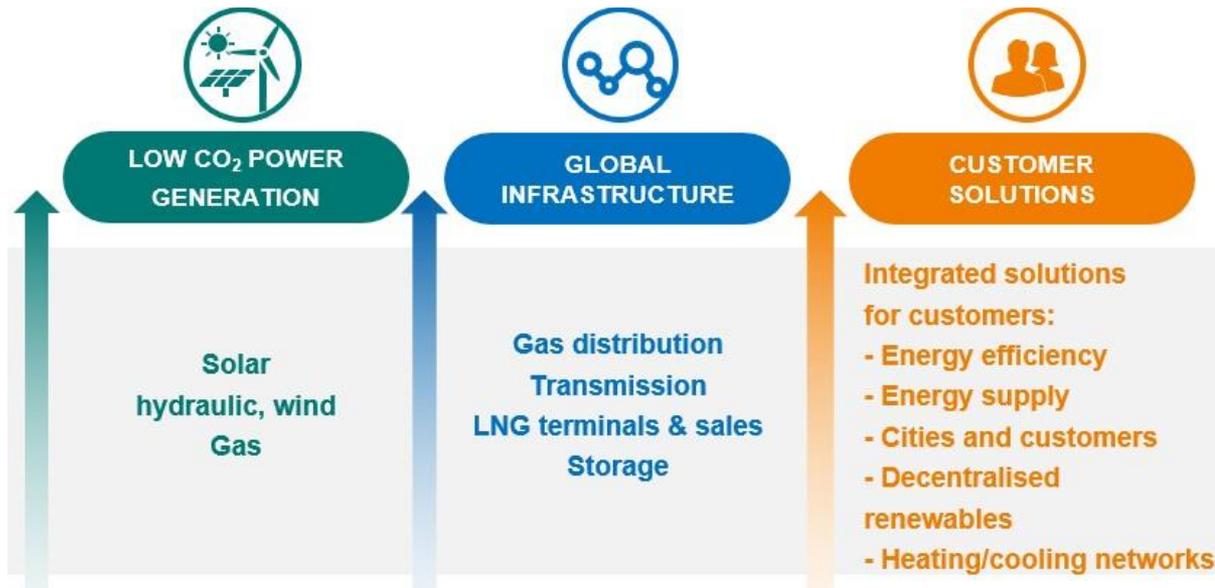
Focus on Mining Sector



ENGIE

5 December 2018
IPHE 30th Steering Committee Events

ENGIE: Activities and Key Figures



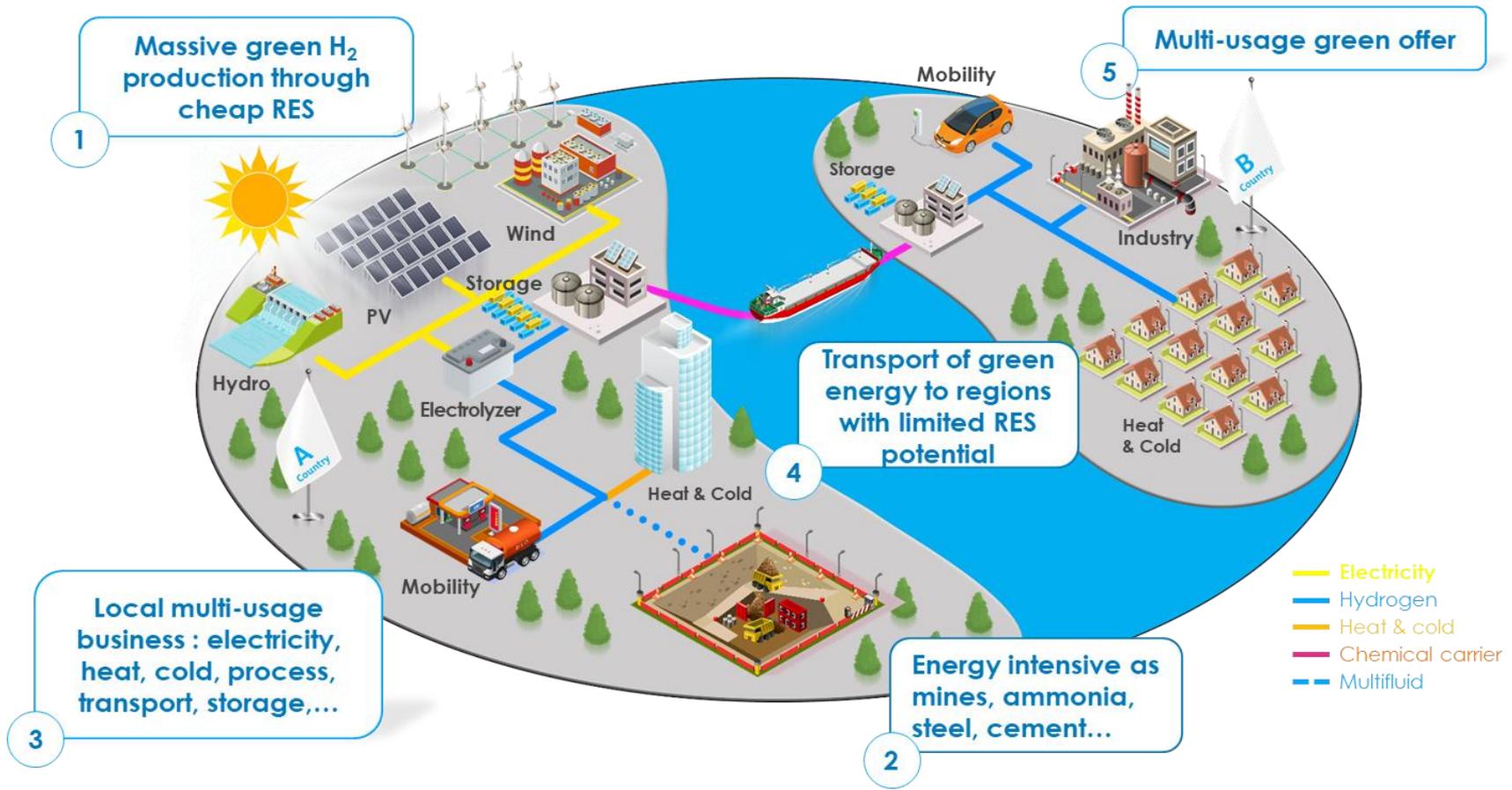
155,000 employees throughout the world

Operations in **70** countries

€22 billion of investment over 2016-2018

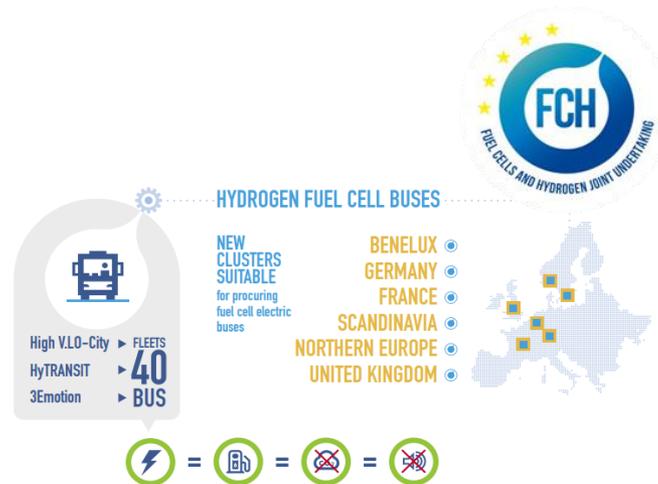
€65 billion in 2017 revenues

ENGIE's vision on H2 Economy

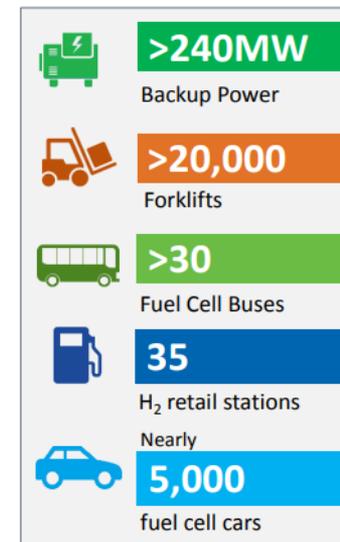


Reality Check - H2 Progress

- >20,000 Forklifts
- >8,000 Cars and >250 fueling stations
- >500 Buses
- 1 passenger Train



U.S. Snapshot



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Are we focusing on the correct applications?
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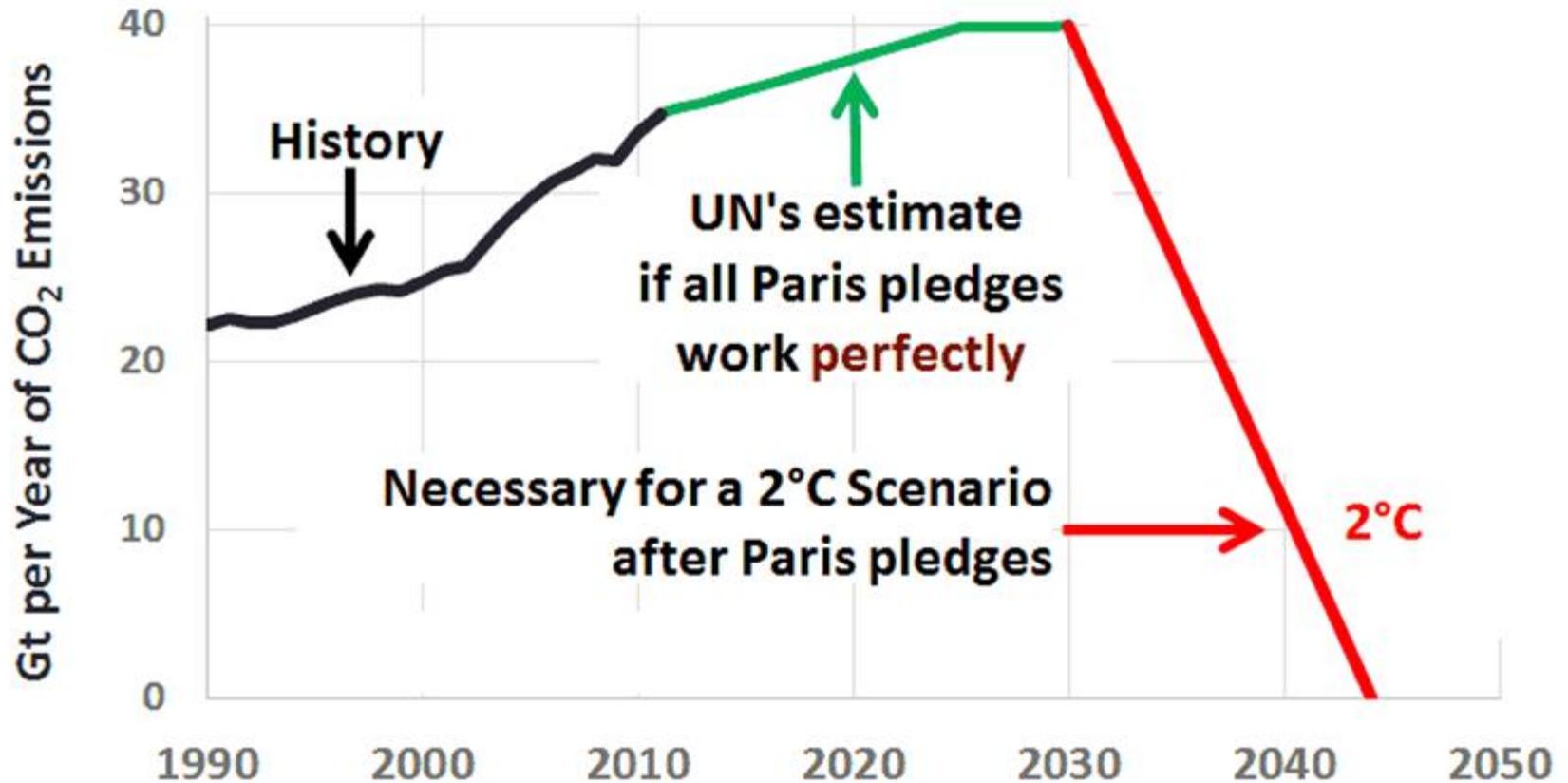
1 Mining Truck



~200 Cars

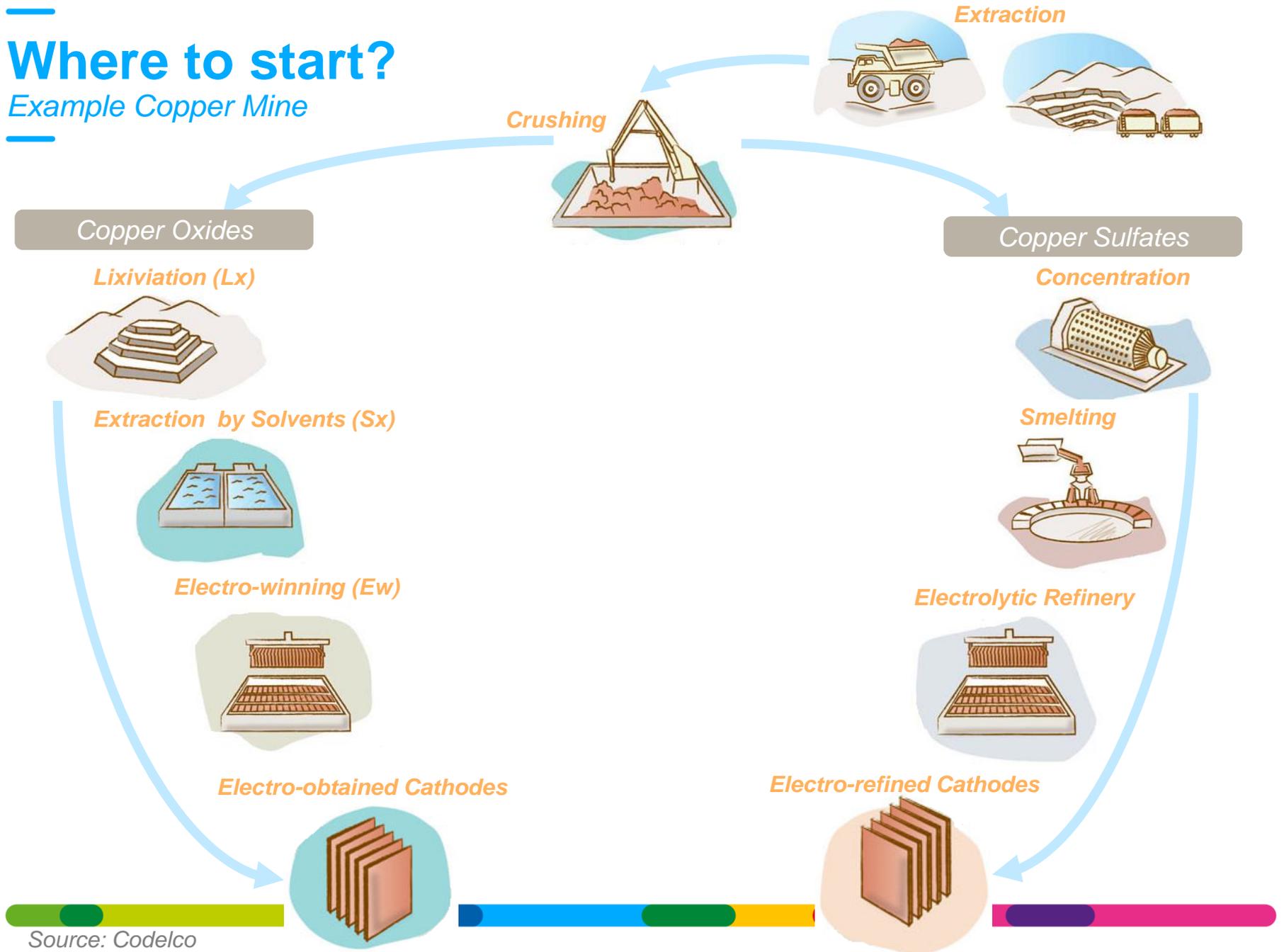


We need to scale up now to reach Climate Goals



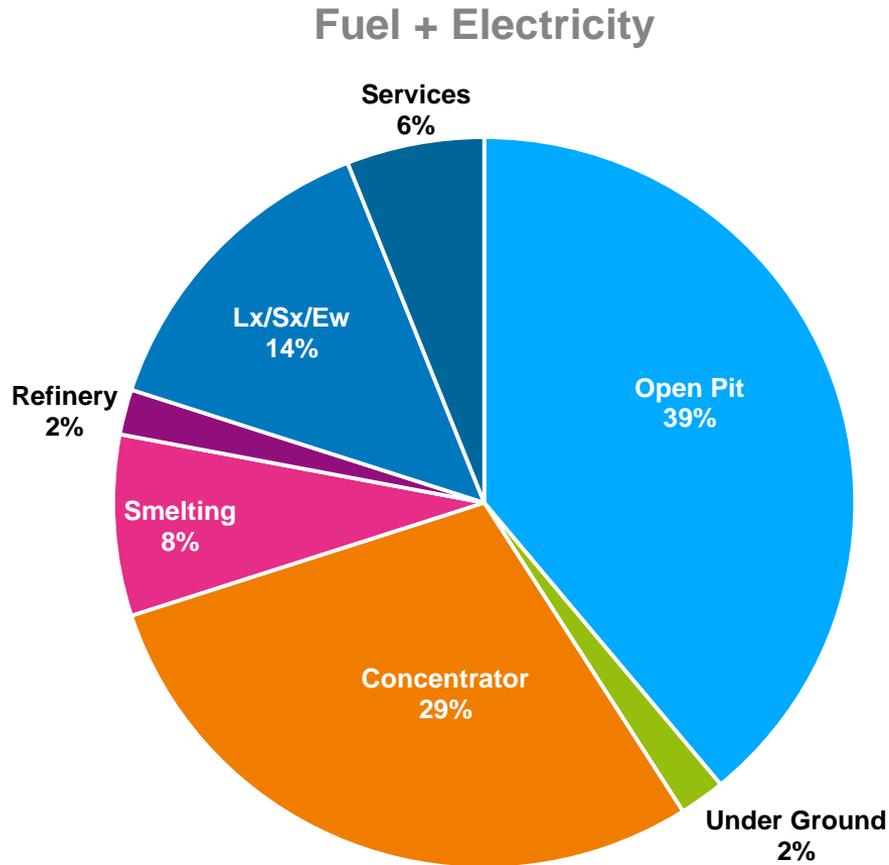
Where to start?

Example Copper Mine

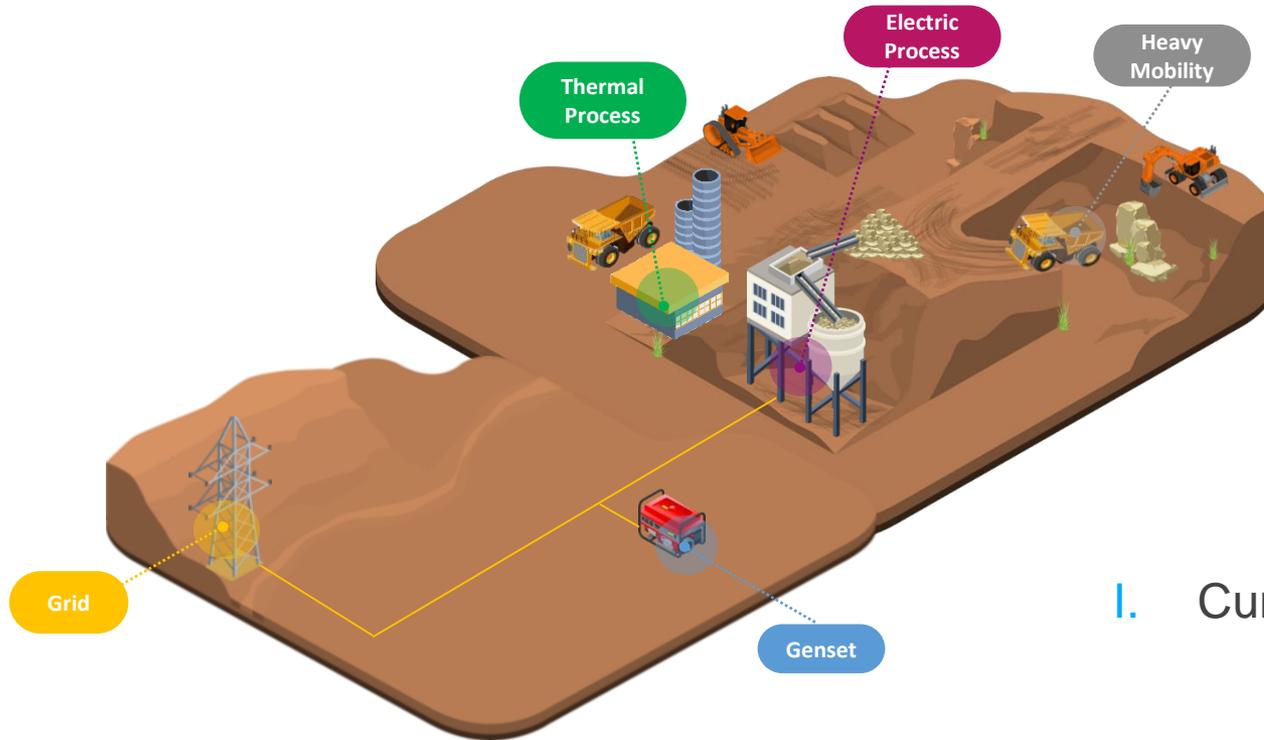


Understand how energy is consumed

Example Copper Mine



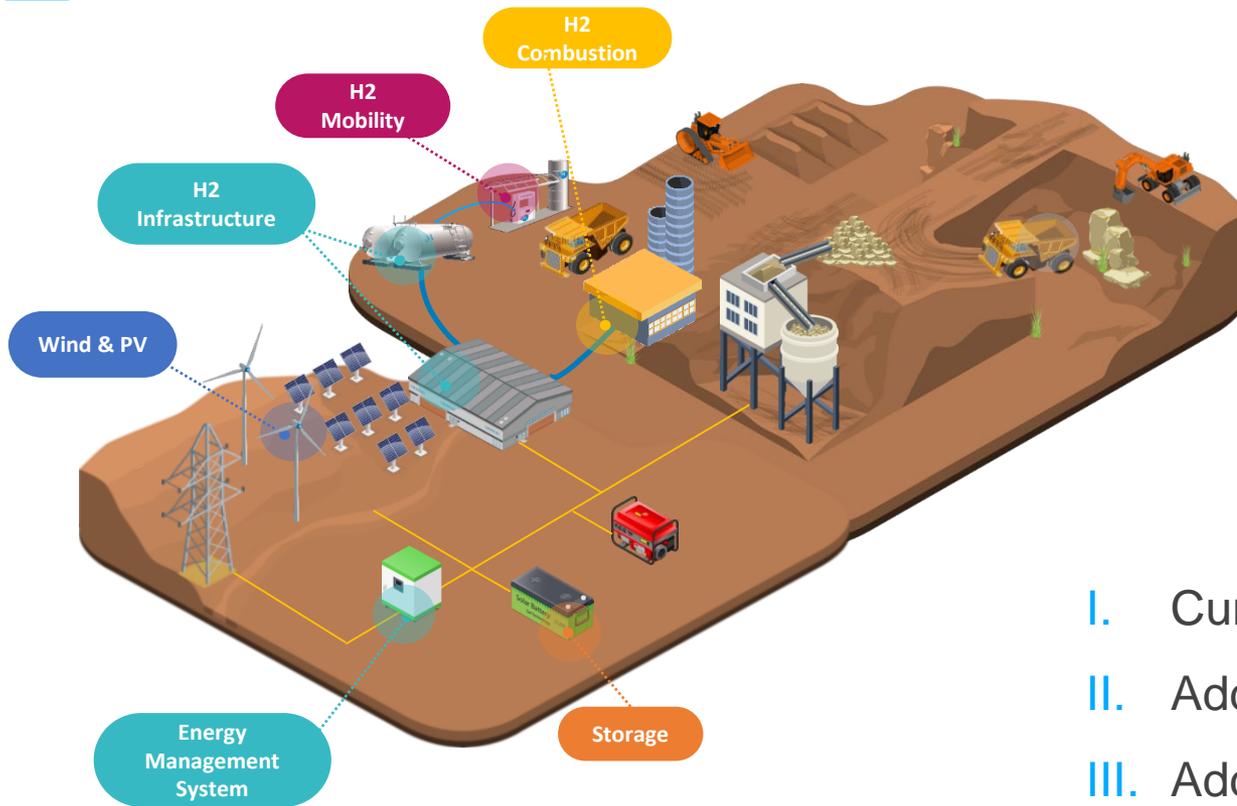
How to reach zero-emission mining?



I. Current Situation

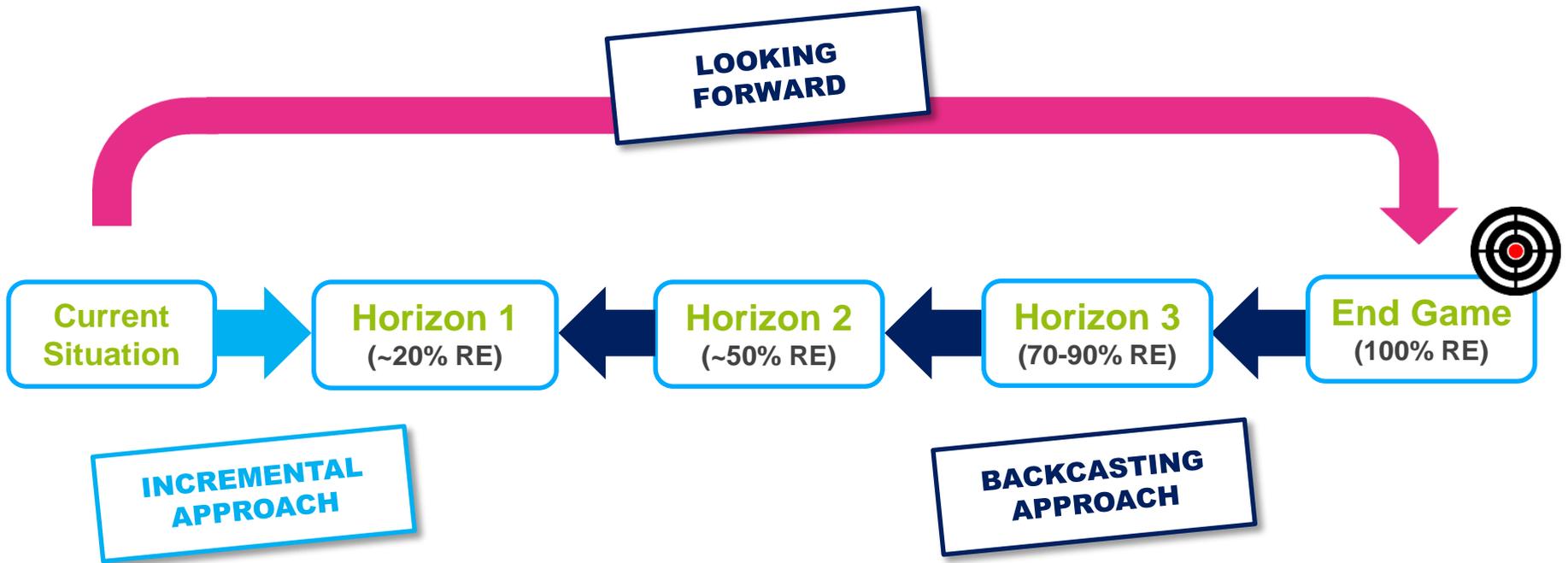
(*) Note: Hybrid System can be at Centralized or Decentralized Level

How to reach zero-emission mining?

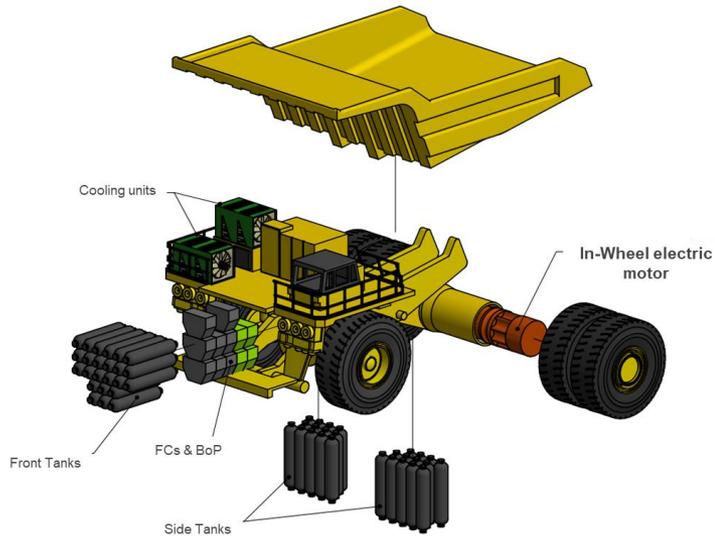


- I. Current Situation
- II. Add Renewables
- III. Add Battery Storage
- IV. Integrate H2 Storage
- V. H2 as Energy Vector

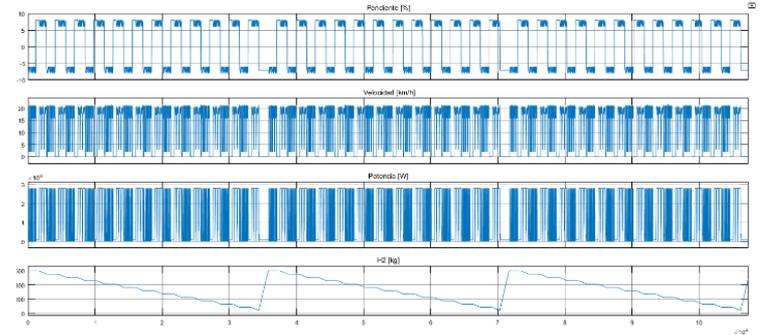
Look at the End Game to identify required steps



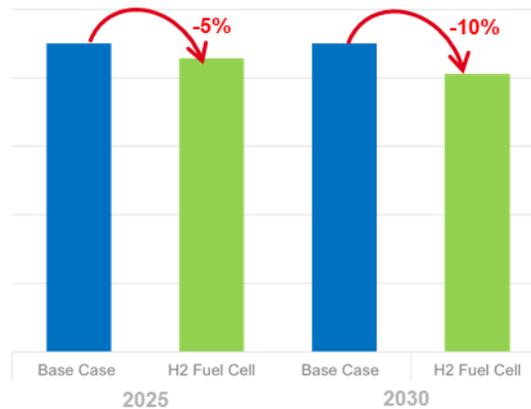
ENGIE has already taken some first steps



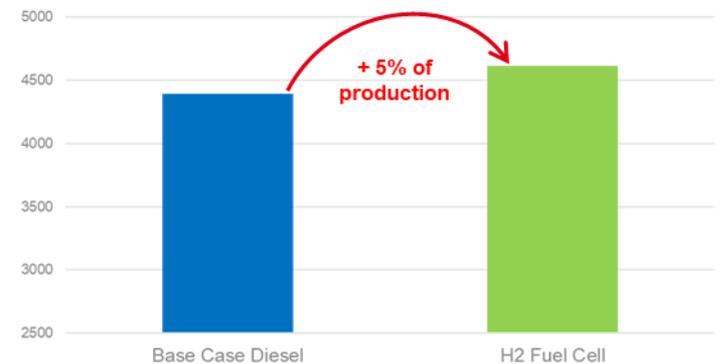
Green Mining & Optimization Model



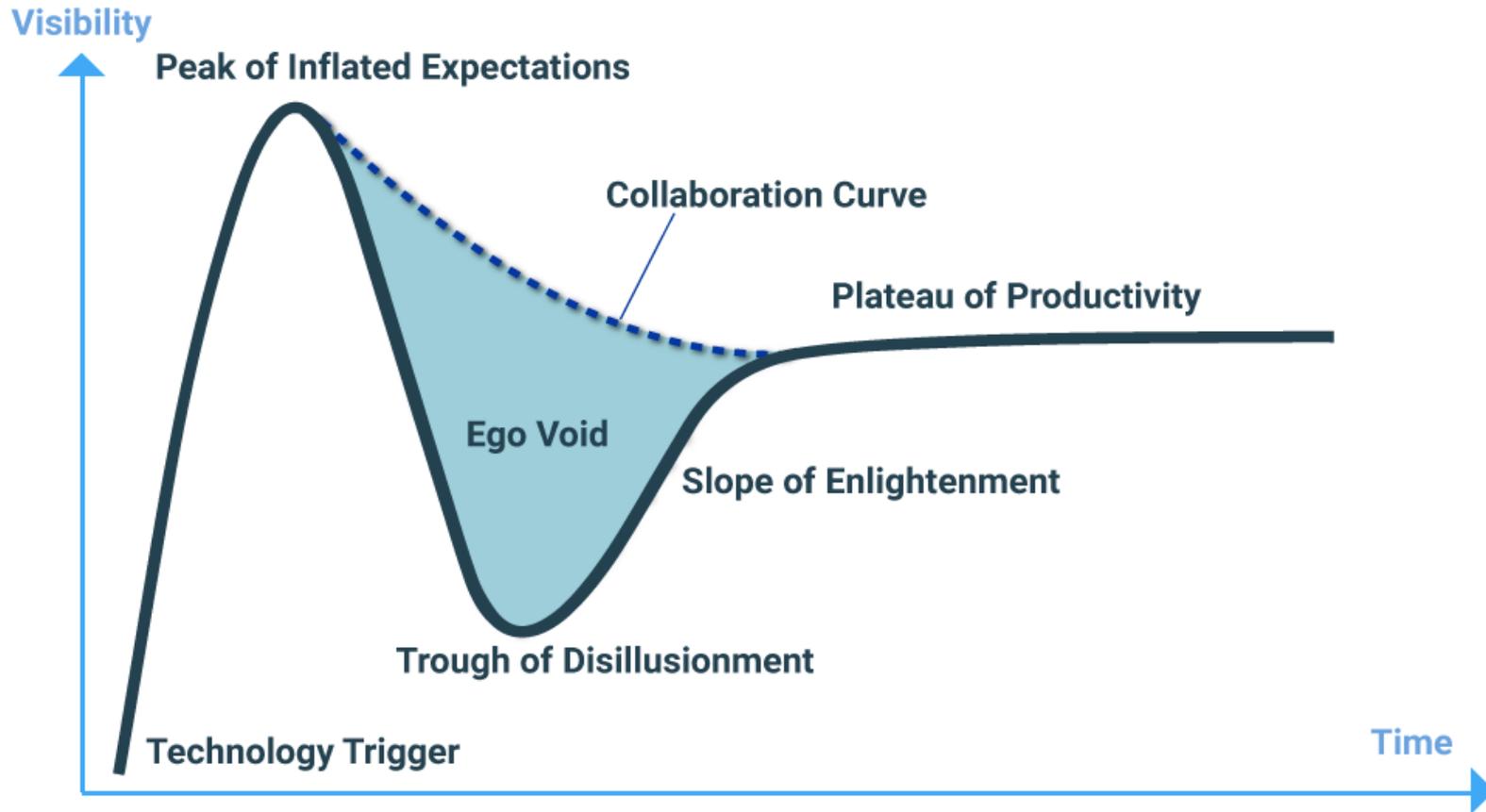
Hauling energy costs [USD/ mille]



Annual Productivity [Mton/year]



We need to Co-Create TOGETHER



The ENGIE logo is positioned in the top right corner of the slide. It features the word "ENGIE" in a white, bold, sans-serif font, with a white semi-circular arc above the letters "E" and "I". The background of the slide is a photograph of a large yellow mining truck filled with grey rocks, set against a dramatic sky with a bright sun and orange-hued clouds. The truck is viewed from a low angle, emphasizing its size.

ENGIE

***Let's continue the journey
together !***

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Image Source: CSIRO