sunfire®

RENEWABLES EVERYWHERE

Import Renewables from Anywhere

20.10.2020 Carl Berninghausen

THE NORSK E-FUEL PROJECT

- European Consortium industrializing PtL technology in Norway
- Norsk e-Fuel will realize a series of e-Fuel projects with integrated, standardized plant lay-out + performance warranty
- Proprietary technology and world-wide patents – Norsk e-Fuel offers the most efficient and economic PtL pathway including world leading Direct Air Capture of CO_2

Sunfire demo plant, Dresden (GER) 2020

Alpha plant in Herøya (NOR) with approx. 10m L/a capacity 2023

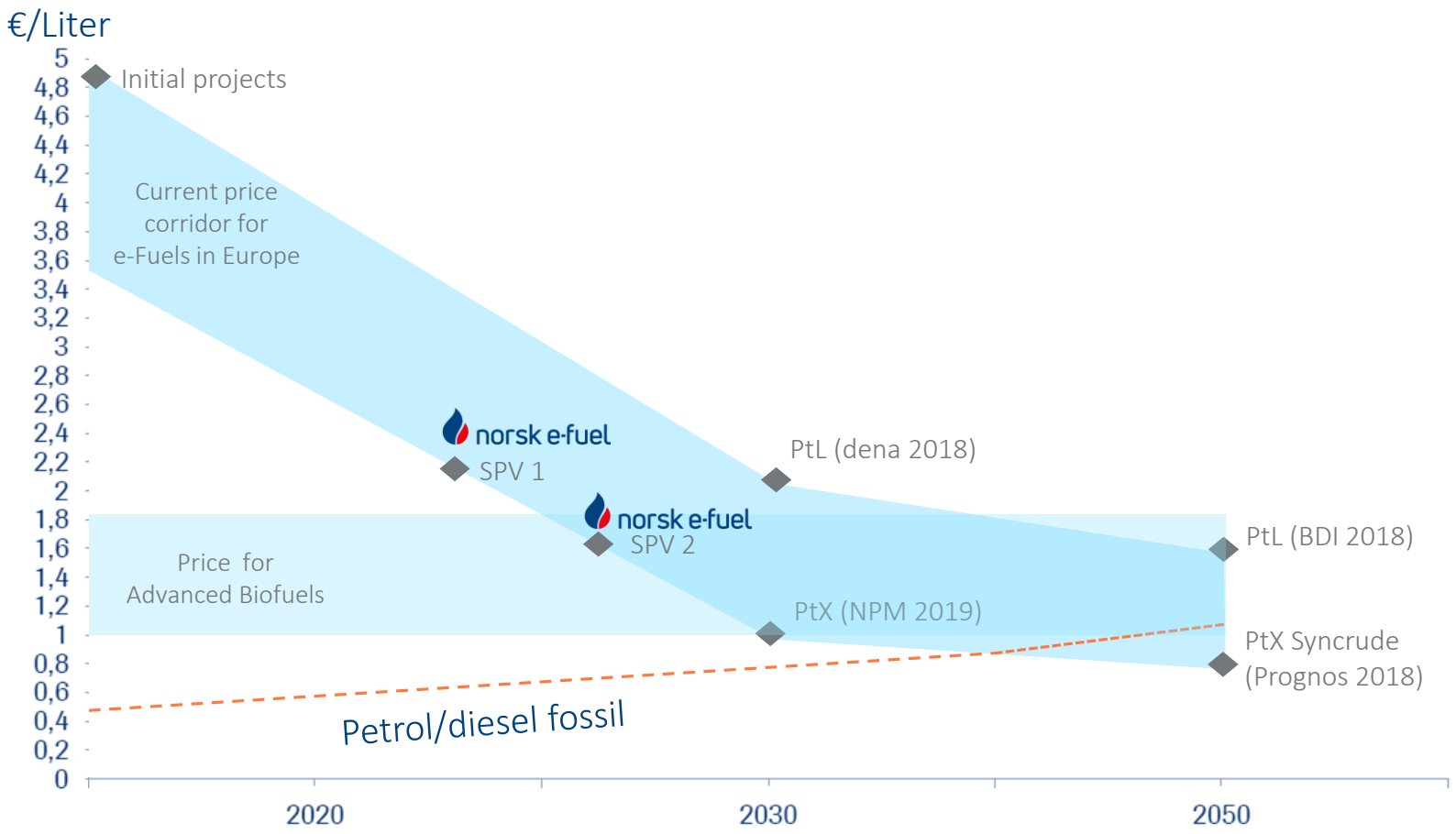
Climeworks demo plant, Zürich (HE) 2018

ENERGIEEFFIZIENZ MIT SUNFIRE TECHNOLOGIE

	Direct Charging Battery Electric Vehicle	Hydrogen Fuel Cell Vehicle	E-Fuel Conventional Vehicle
	100% renewable Energy	100% renewable Energy	100% renewable Energy
Electrolysis		- 30 % energy loss	- 40% energy loss
DAC/FT-Synthesis			
Transport, Storage and Distribution	- 5 %	- 26 %	
Fuel production efficiency	95 %	52 %	60 %
Inversion AC/DC	- 5 %		
Battery Charge Efficiency	- 5 %		
Conversion H2/Electricity		- 50 %	
Inversion DC/AC	- 5 %	- 5 %	
Engine Efficiency	- 10%	- 10%	- 70%
Overall Efficiency	73 %	22 %	18 %
Electricity Price	160 €/MWh_{el}	50 €/Mwh_{el}	30 €/Mwh_{el}
Cost per MWh of Motion Energy	219 €/MWh	227 €/MWh	167 €/MWh

Source: Transport and Environment, apart from lower energy loss calculations through Sunfire technology

BASIC ECONOMICS OF POWER-TO-LIQUIDS



±0,15 €/l e-Crude

±10 €/MWh Electricity

±50 €/t CO_2

±150 Mio.€ CAPEX

Source: BDI: Klimapfade für Deutschland (2018); Prognos: Status und Perspektiven flüssiger Energieträger in der Energiewende (2018); Nationale Plattform Zukunft der Mobilität AG1: Zwischenbericht (2019); Dena/LBST: Das Potenzial strombasierter Kraftstoffe für einen klimaneutralen Verkehr in der EU (2017); Dena: Integrierte Energiewende (2018)

THANK YOU!

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