

ALFAFUELS WS

NOVEMBER 25, 2026

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AGENDA

Time	Topic	Partner
10:00-10:05	Introduction to the ALFAFUELS Horizon project	RISE
10:05-10:20	The PRIMES Aviation model	WSP
10:20-10:35	TEA and LCA analysis	IDE & UCPH
10:35-11:00	Alfafuel deployment assessment	WSP
11:20-11:25	Interactive session	Open
11:25-11:30	Next steps	WSP





Introduction

Scope of the Alfafuels project

- The scope of the ALFAFUELS project is to develop a novel route for the production of an algae-based RFNBO (Alfafuel) to be used in the aviation sector
- This presentation aims to provide initial insights on the behavior of the modelling toolbox that will be used to assess the potential deployment of the Alfafuel in the EU, in the long term.
- The final data of the TEA & LCA analysis (Idener & UCPH) will be used in the market uptake analysis that will be submitted along with the complete PESTLE analysis of the Alfafuel [**December 2027**]



WSP

The PRIMES Aviation model

The PRIMES Aviation model (1/2)

The PRIMES Aviation model



Regional level resolution:

Considers a global network of airports:

- EU27 + UK (3 airports per country - 2 largest + 1 aggregator)
- 14 EU Neighboring countries
- 15 Global regions

Total of 2998 OD pairs

Temporal resolution:

- 5-year timestep
- Until 2070

Model outputs

PRIMES-Aviation provides assessments for (amongst other):

- **Aviation transport activity** – as per disaggregation below
- **Fuel use per** fuel type incl. SAF types (HEFA, FT+Gas, AtJ, PtL, **Alfafuel**)

Fuel price impacts and **feedstock availability/competition** with other modes are estimated through the biomass supply model

- **Energy consumption** and **air emissions (CO2, CO, NOx and PM)**
- **Fleet projections** accounting for scrappage/renewals - includes vintages of aircrafts and shifting technology characteristics
- Aviation **sector cost**s covering CAPEX (aircraft investments) and OPEX (including fuel, ETS costs etc.) and **consumer prices** for flight tickets
- **Modal shifts** and balances of energy use with other modes of transport by running together with PRIMES-TREMOVE associated

Key features that can be adjusted

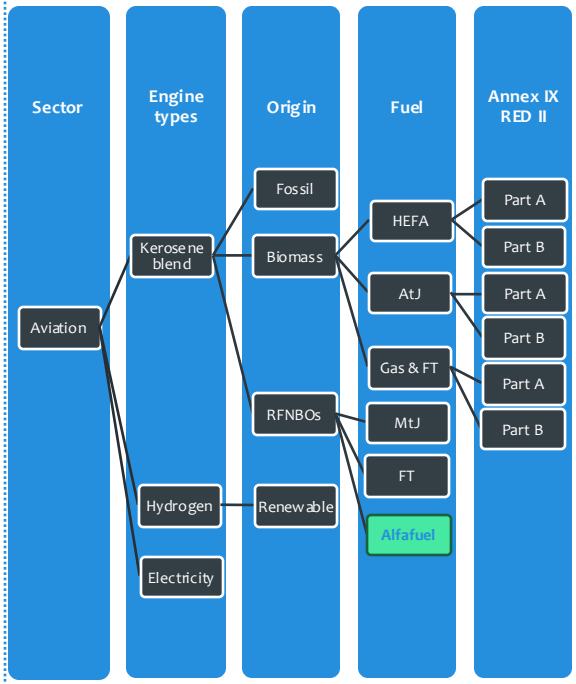
- **Specific SAF types** and **Alfafuel**, and see how price signals affect their uptake
- Other **air emissions** can be added linked to the use of specific fuels – and limited to certain flights
- **Price signals** also for CO2 and non-CO2 emissions e.g. ETS or other form
- **CAPEX or OPEX cost** adjustments to reflect new technologies/requirements
- Changes in **fuel burned/flight distances** between specific OD pairs
- We could also consider how to potentially **optimize measure design** between non-CO2 emissions and additional fuel burned

Activity Splits

Aircraft sizes	Engine type	Fuel types	Trips	Trip purpose	Income classes	Carrier types
Jumbo jet	Jet fuel	Kerosene	Domestic	Business	High	Low Cost Carriers
Narrow-body jet	Jet hybrid	SAF (of specific types)	Intra-EU	Leisure	Low	Full Service
Wide-body jet	Electric	H2	Extra-EU	Passengers		
Regional jet	Fuel cell	Electricity		Freight		
Regional Turboprop	H2 ICE	Alfafuels				

The PRIMES Aviation model (2/2)

The fuel mix module of the PRIMES Aviation model



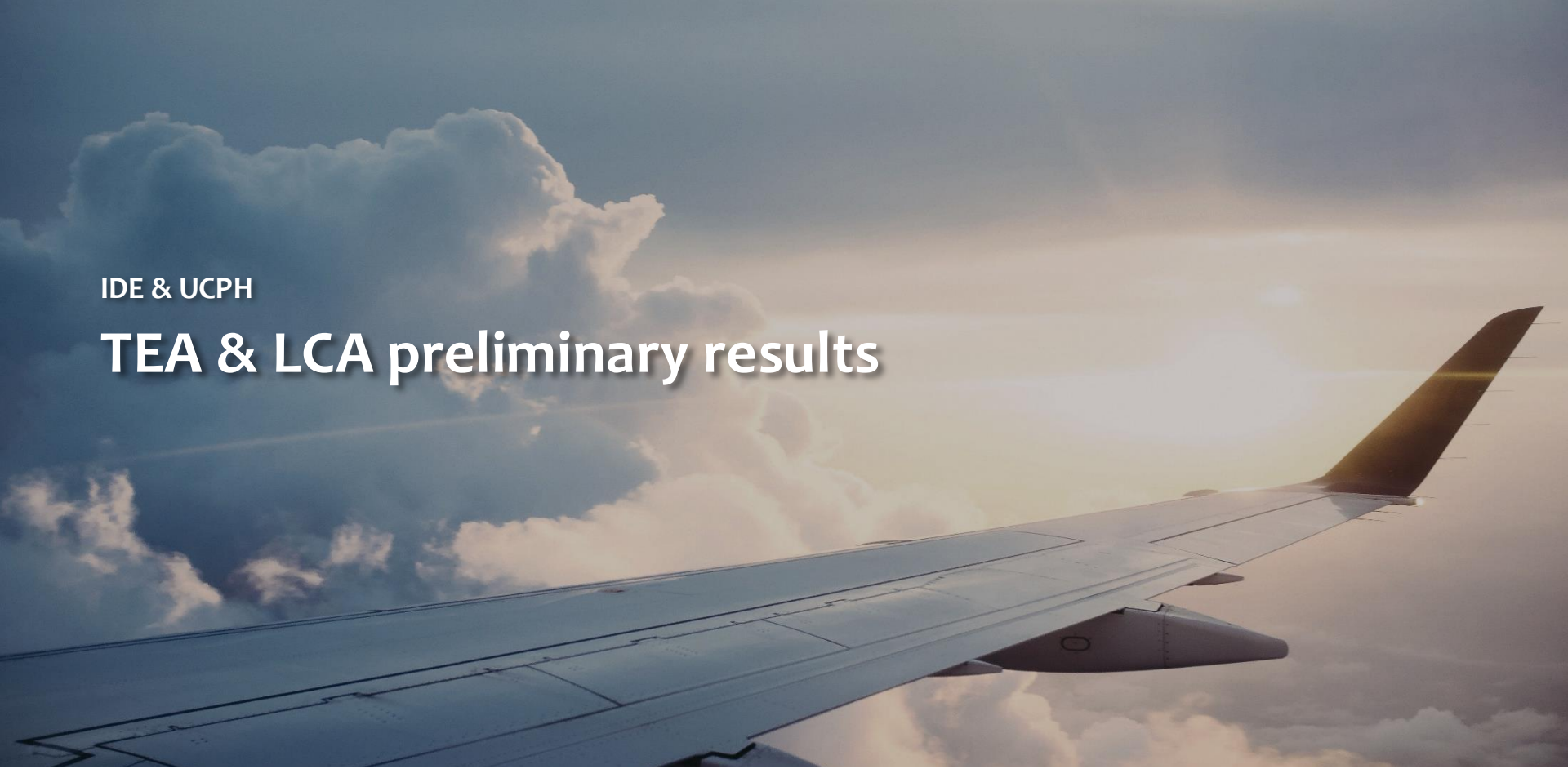
The fuel mix module can be represented as a four-level nested structure,

- Demand for kerosene blend is met by Fossil, Biokerosene and RFNBOs
- Biokerosene options include three main pathways, **HEFA**, **AtJ** and **Fischer-Tropsch**
- Biokerosene choice is further disaggregated into Part A and Part B based on the feedstock origin
- RFNBOs include **Methanol-to-Jet** and **FT e-kerosene** and **Alfafuel**
- The model's structure allows for possible substitution among the different fuel choices

The fuel choice model is based on cost-optimization of the fuel mix while simultaneously considering,

- Market conditions regarding availability / sustainability of primary feedstocks
- Level of technology maturity for the different fuel types
- Renewable energy targets or blending mandates for specific fuels (i.e., RES-T, ReFuelEU Aviation, etc.)
- Blending limits
- Policy driven cost adjustments on specific fuel types (i.e., ETS 1 and other related taxes, fuel subsidies, etc.)

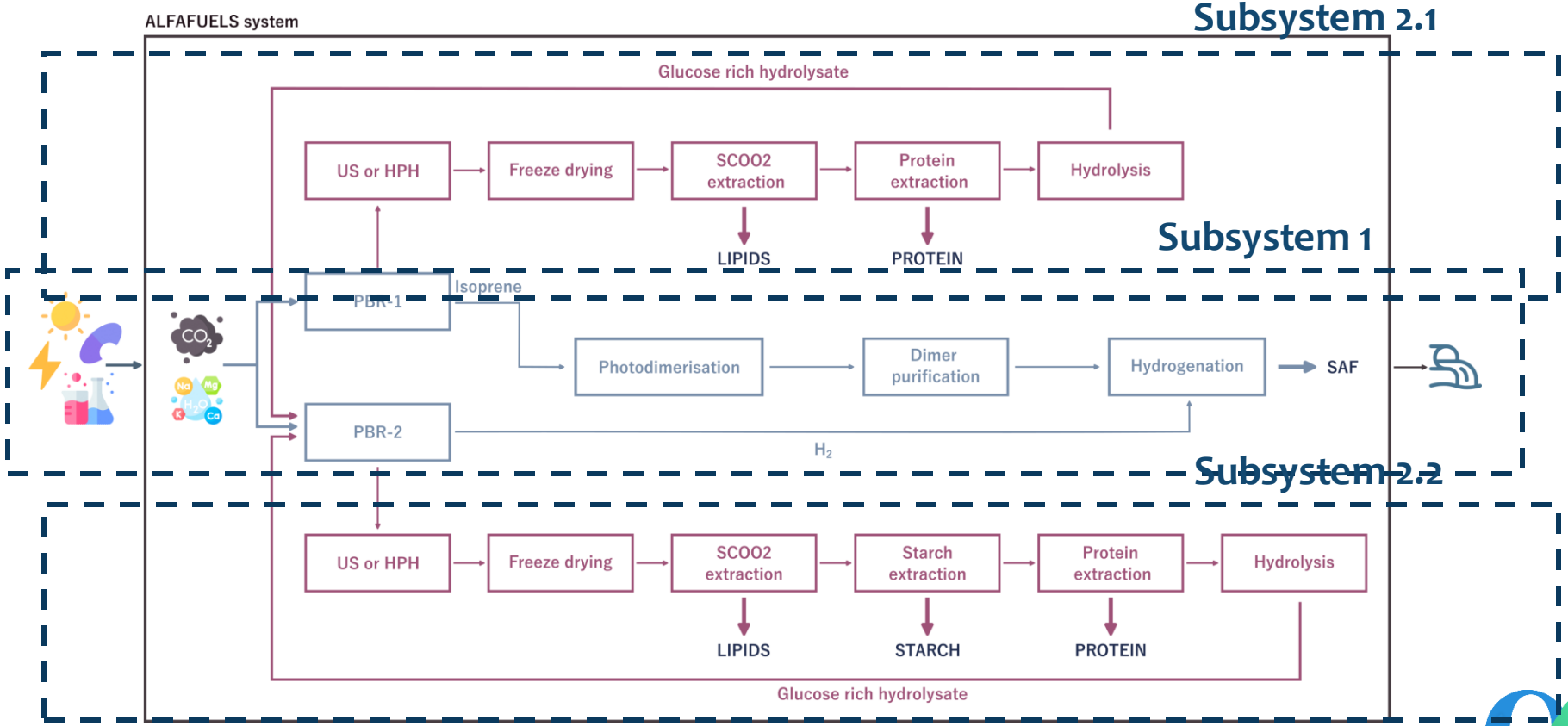
In the current analysis, the **Alfafuel** is constrained by a 10% blending wall in the kerosene blend (*based on a similar case-study from the literature*)



IDE & UCPH

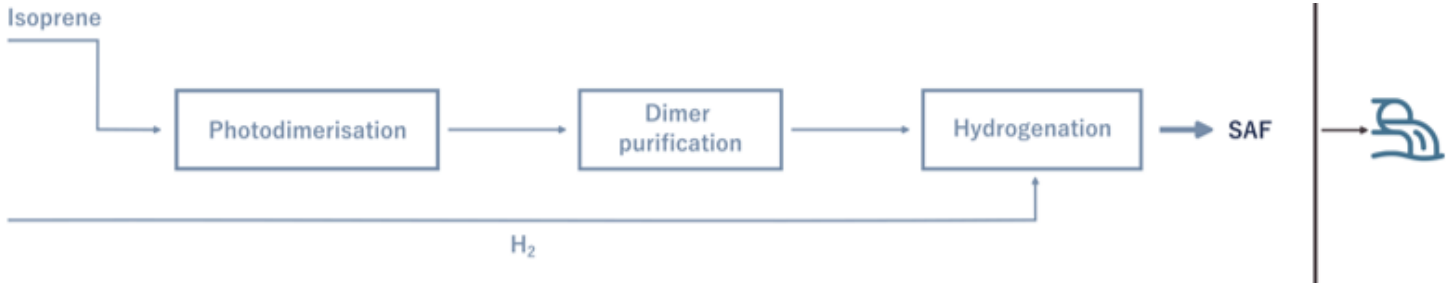
TEA & LCA preliminary results

ALFAFUELS system



Alfafuels TEA scenario case 0

Why define a Case 0 scenario?
Availability of experimental data and assessment of isoprene and hydrogen prices

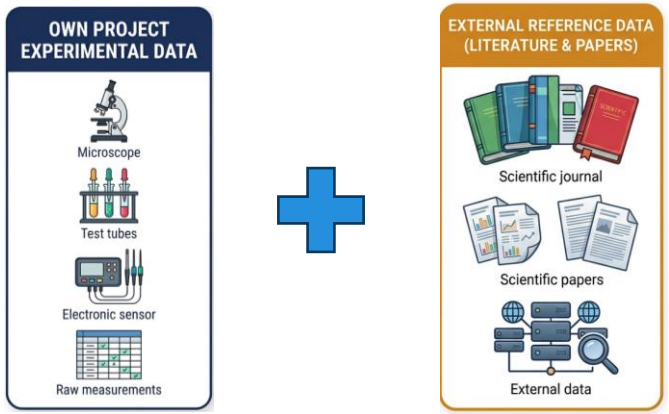


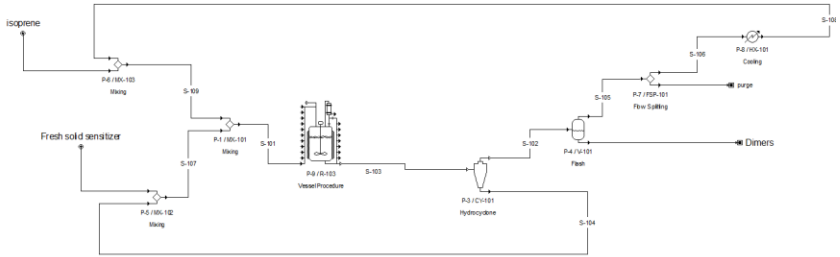
- Steps covered are photodimerization, purification and hydrogenation
- Isoprene and hydrogen are feedstocks (purchased inputs)
- Scale of production of 30,4 kton of SAF/year[1]

1 https://www.lanzajet.com/news-insights/lanzajet-marks-major-milestone-on-its-freedom-pines-fuels-construction

Alfafuels TEA methodology

Step 1: Case 0 process modelling

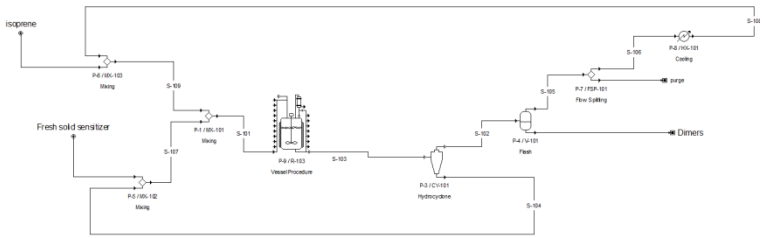


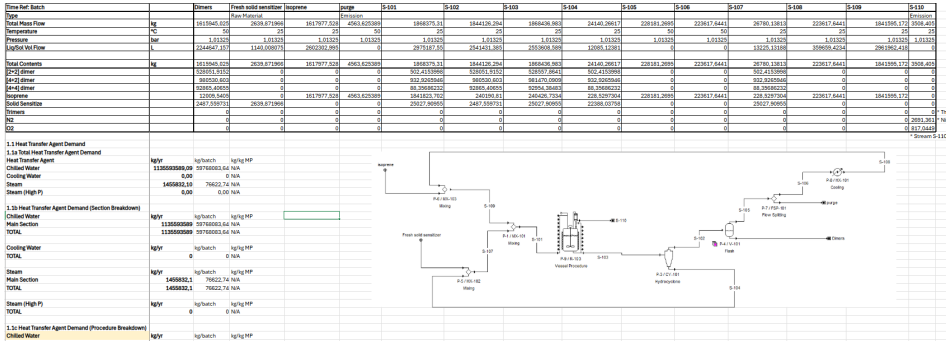


- The modelling and simulation was performed using the SuperPro Designer software.
- Information about the equipment type, flows, conversion, selectivity, separation and recycle streams is introduced into the software.
- Literature-sourced data will be replaced by experimental data as soon as it is available.

Alfafuels TEA methodology

Step 2: Technical inventory





Time Ref: Batch		Dimers	Fresh solid sensitizer	isoprene	purge	S-101	S-102	S-103	S-104	S-105	S-106	S-107	S-108	S-109	S-110
Type			Raw Material		Emission										Emission
Total Mass Flow	kg	1615945,025	2639,871966	1617977,528	4563,625389	1868375,31	1844126,294	1868436,983	24140,26617	228181,2695	223617,6441	26780,13813	223617,6441	1841595,172	3508,405
Temperature	°C	50	25	25	50	25	25	25	25	50	50	25	25	25	25
Pressure	bar	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325
Log/Sol Vol Flow	L	2244647,157	1140,008073	2602392,995	0	2975187,55	2541431,385	2553608,589	12085,12381	0	0	13225,13188	356659,4234	2961962,418	0
Total Contents	kg	1615945,025	2639,871966	1617977,528	4563,625389	1868375,31	1844126,294	1868436,983	24140,26617	228181,2695	223617,6441	26780,13813	223617,6441	1841595,172	3508,405
[2+2] dimer		328051,9152	0	0	0	502,4153998	328051,9152	328057,8641	502,4153998	0	0	502,4153998	0	0	0
[4+2] dimer		980530,603	0	0	0	932,9265946	980530,603	981470,0909	932,9265946	0	0	932,9265946	0	0	0
[4+4] dimer		92865,40655	0	0	0	88,35686232	92865,40655	92954,38483	88,35686232	0	0	88,35686232	0	0	0
Isoprene		12005,5405	0	1617977,528	4563,625389	1841823,762	240190,81	240426,7334	228,5297304	228181,2695	223617,6441	228,5297304	223617,6441	1841595,172	0
Solid Sensitize		2487,559731	2639,871966	0	0	25027,90955	2487,559731	25027,90955	22388,03758	0	0	25027,90955	0	0	0
Trimers		0	0	0	0	0	0	0	0	0	0	0	0	0	0
N2		0	0	0	0	0	0	0	0	0	0	0	0	0	2891,361
O2		0	0	0	0	0	0	0	0	0	0	0	0	0	817,0449

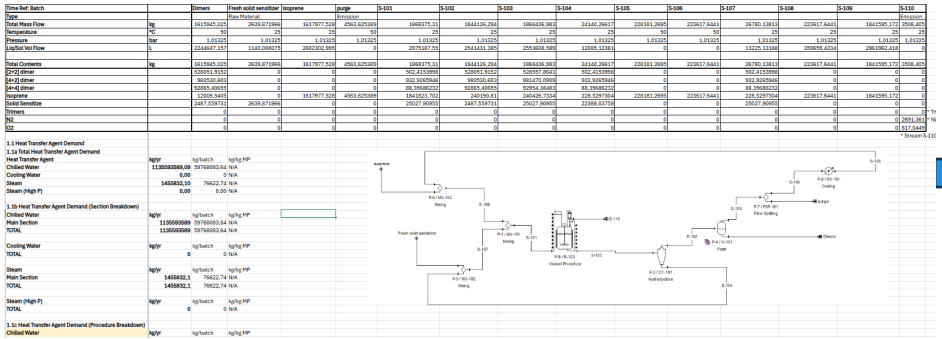
* Stream S-110

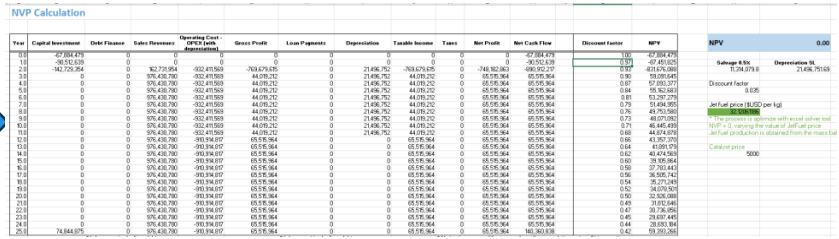
1.1 Heat Transfer Agent Demand			
1.1a Total Heat Transfer Agent Demand			
Heat Transfer Agent	kg/yr	kg/batch	kg/kg MP
Chilled Water	**1135593589,09**	59766003,64	N/A
Cooling Water	**0,00**	0	N/A
Steam	**1455832,10**	76622,74	N/A
Steam (High P)	**0,00**	0,00	N/A
1.1b Heat Transfer Agent Demand (Section Breakdown)			
Chilled Water	kg/yr	kg/batch	kg/kg MP
Main Section	**1135593589**	59766003,64	N/A
TOTAL	**1135593589**	59766003,64	N/A
Cooling Water	kg/yr	kg/batch	kg/kg MP
TOTAL	**0**	0	N/A
Steam	kg/yr	kg/batch	kg/kg MP
Main Section	**1455832,1**	76622,74	N/A
TOTAL	**1455832,1**	76622,74	N/A
Steam (High P)	kg/yr	kg/batch	kg/kg MP
TOTAL	**0**	0	N/A
1.1c Heat Transfer Agent Demand (Procedure Breakdown)			
Chilled Water	kg/yr	kg/batch	kg/kg MP

- The simulation results in stream flows and energy data.
- This data is used to estimate the required capacity and equipment based on the target throughput and the relevant operating parameters, such as temperature and pressure.
- Electricity, heat, cooling, feedstock consumption, catalysts, solvents and other consumables (if required) are quantified.

Alfafuels TEA methodology

Step 3: Economic assessment

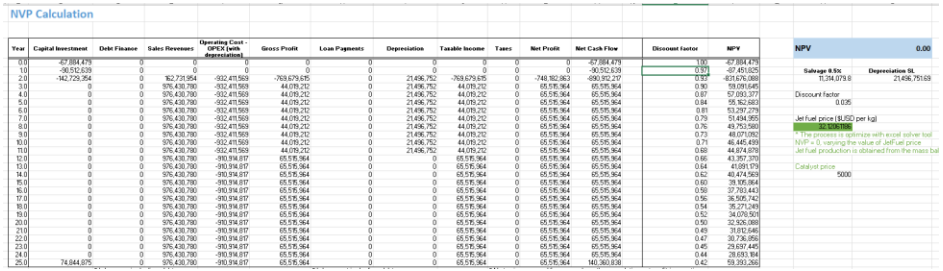




- Estimation of equipment's cost and installation (CAPEX)
- Estimation of operating costs including the feedstock prices, utilities, consumables, catalyst replacement, labor, maintenance and waste handling, as applicable (OPEX)
- Estimation of economical parameters: SAF MSP, NPV, IRR, payback period.

Alfafuels TEA methodology

Step 4: Interpretation and future work


NVP Calculation

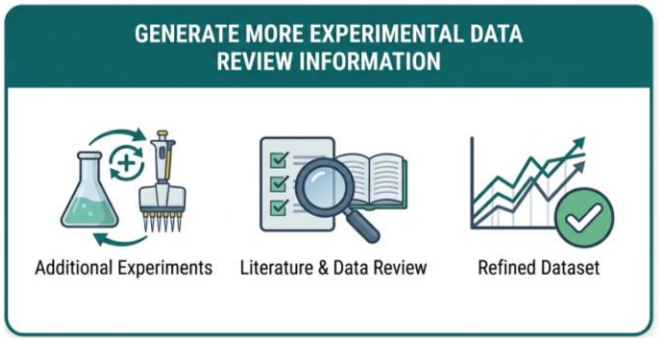
Year	Capital Investment	Debt Finance	Sales Revenues	Operating Cost - OPEX (with depreciation)	Gross Profit	Loan Payments	Depreciation	Taxable Income	Taxes	Net Profit	Net Cash Flow	Discount factor	NPV
0.0	-67,884,479	0	0	0	0	0	0	0	0	0	-67,884,479	1.00	-67,884,479
1.0	-90,512,639	0	0	0	0	0	0	0	0	0	-90,512,639	0.97	-87,451,625
2.0	-142,729,354	0	162,731,954	-932,411,569	-769,679,615	0	21,496,752	-769,679,615	0	-748,182,863	-890,912,217	0.93	-831,676,088
3.0	0	0	976,438,780	-932,411,569	44,019,212	0	21,496,752	44,019,212	0	65,515,964	65,515,964	0.90	59,091,645
4.0	0	0	976,438,780	-932,411,569	44,019,212	0	21,496,752	44,019,212	0	65,515,964	65,515,964	0.87	57,093,377
5.0	0	0	976,438,780	-932,411,569	44,019,212	0	21,496,752	44,019,212	0	65,515,964	65,515,964	0.84	55,162,683
6.0	0	0	976,438,780	-932,411,569	44,019,212	0	21,496,752	44,019,212	0	65,515,964	65,515,964	0.81	53,297,279
7.0	0	0	976,438,780	-932,411,569	44,019,212	0	21,496,752	44,019,212	0	65,515,964	65,515,964	0.79	51,494,955
8.0	0	0	976,438,780	-932,411,569	44,019,212	0	21,496,752	44,019,212	0	65,515,964	65,515,964	0.76	49,753,580
9.0	0	0	976,438,780	-932,411,569	44,019,212	0	21,496,752	44,019,212	0	65,515,964	65,515,964	0.73	48,071,092
10.0	0	0	976,438,780	-932,411,569	44,019,212	0	21,496,752	44,019,212	0	65,515,964	65,515,964	0.71	46,445,499
11.0	0	0	976,438,780	-932,411,569	44,019,212	0	21,496,752	44,019,212	0	65,515,964	65,515,964	0.68	44,874,876
12.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.66	43,357,370
13.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.64	41,891,179
14.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.62	40,474,569
15.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.60	39,105,864
16.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.58	37,783,443
17.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.56	36,505,742
18.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.54	35,271,249
19.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.52	34,079,501
20.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.50	32,926,088
21.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.49	31,812,646
22.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.47	30,736,956
23.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.45	29,697,445
24.0	0	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	65,515,964	0.44	28,693,184
25.0	74,844,875	0	976,438,780	-910,914,817	65,515,964	0	0	65,515,964	0	65,515,964	140,360,839	0.42	59,393,266

NPV	0.00
Salvage 8.5%	Depreciation SL
11,394,079.8	21,496,751.69
Discount factor	
0.035	
Jet fuel price ($USD per kg)	
12.126756	

* The process is optimize with excel solver tool
NVP = 0, varying the value of JetFuel price
Jet fuel production is obtained from the mass bal

Catalyst price
5000



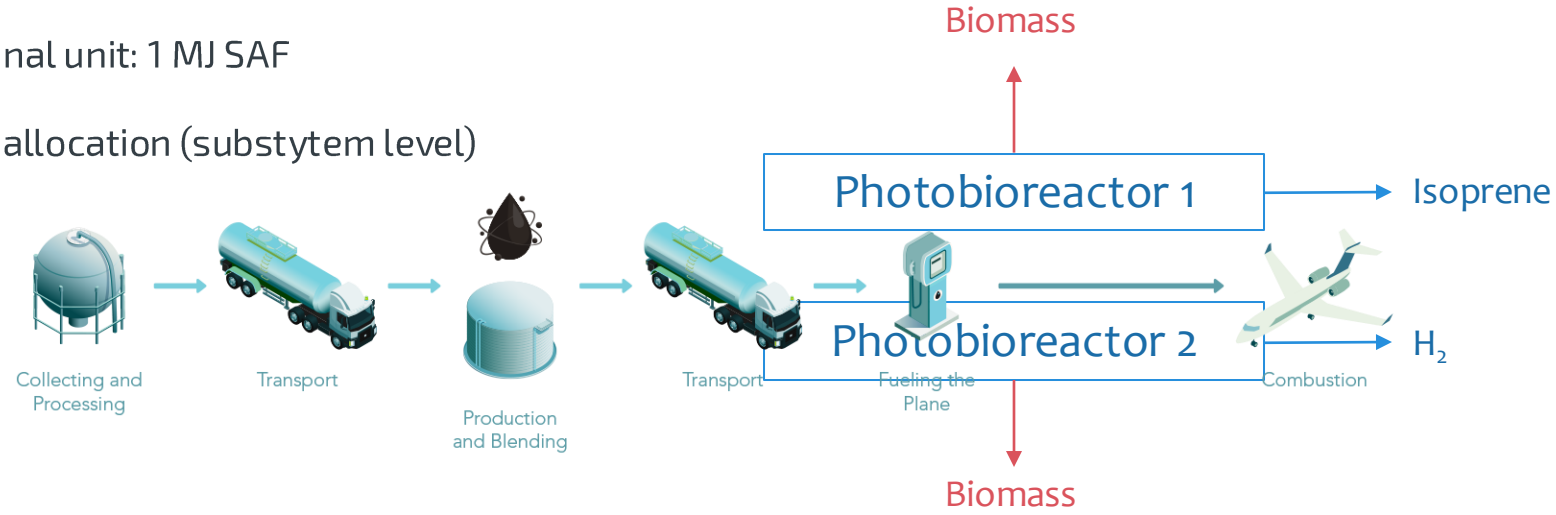


- Analyse key uncertainties in process performance and operating parameters.
- Assess production-cost ranges for isoprene and hydrogen.
- Identify the main process bottlenecks.
- Prioritise further experiments and data collection to update the model and strengthen the TEA.

LCA methodology

Goal & Scope

- System boundary: cradle-to-grave (well-to-pump)
- Exclusion of infrastructure and equipment
- Functional unit: 1 MJ SAF
- Energy allocation (substytem level)



LCA methodology

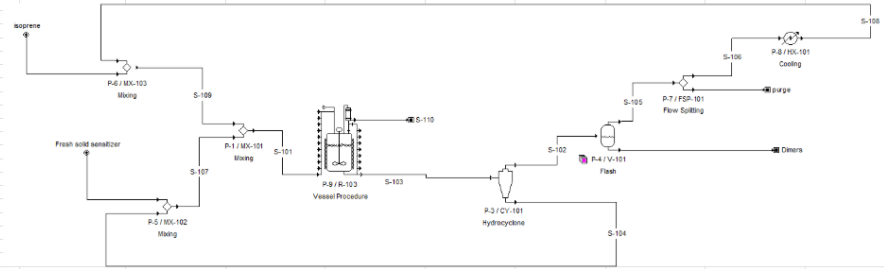
Life Cycle Inventory

- Modelling work + Ecoinvent 3.12

Time Ref: Batch		Dimers	Fresh solid sensitizer	isoprene	purge	S-101	S-102	S-103	S-104	S-105	S-106	S-107	S-108	S-109	S-110
Type			Raw Material		Emission										Emission
Total Mass Flow	kg	1615945,025	2639,871966	1617977,528	4563,625389	1868375,31	1844126,294	1868436,983	24140,26617	228181,2695	223617,6441	26780,13813	223617,6441	1841595,172	3508,405
Temperature	°C	50	25	25	50	25	25	25	25	50	50	25	25	25	25
Pressure	bar	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325	1,01325
Liq/Sol Vol Flow	L	2244647,157	1140,008075	2602302,995	0	2975187,55	2541431,385	2553608,589	12085,12381	0	0	13225,13188	359659,4234	2961962,418	0
Total Contents	kg	1615945,025	2639,871966	1617977,528	4563,625389	1868375,31	1844126,294	1868436,983	24140,26617	228181,2695	223617,6441	26780,13813	223617,6441	1841595,172	3508,405
[2+2] dimer		528051,9152	0	0	0	502,4153998	528051,9152	528557,8641	502,4153998	0	0	502,4153998	0	0	0
[4+2] dimer		980530,603	0	0	0	932,9265946	980530,603	981470,0909	932,9265946	0	0	932,9265946	0	0	0
[4+4] dimer		92865,40655	0	0	0	88,35686232	92865,40655	92954,38483	88,35686232	0	0	88,35686232	0	0	0
isoprene		12009,5405	0	1617977,528	4563,625389	1841823,702	240190,81	240426,7334	228,5297304	228181,2695	223617,6441	228,5297304	223617,6441	1841595,172	0
Solid Sensitize		2487,559731	2639,871966	0	0	25027,90955	2487,559731	25027,90955	22388,03758	0	0	25027,90955	0	0	0
Trimers		0	0	0	0	0	0	0	0	0	0	0	0	0	0
N2		0	0	0	0	0	0	0	0	0	0	0	0	0	2691,361
O2		0	0	0	0	0	0	0	0	0	0	0	0	0	817,0449

* Th
* Ni
* Stream S-110

1.1 Heat Transfer Agent Demand			
1.1a Total Heat Transfer Agent Demand			
Heat Transfer Agent	kg/yr	kg/batch	kg/kg MP
Chilled Water	1135593589,09	59768083,64	N/A
Cooling Water	0,00	0	N/A
Steam	1455832,10	76622,74	N/A
Steam (High P)	0,00	0,00	N/A
1.1b Heat Transfer Agent Demand (Section Breakdown)			
Chilled Water	kg/yr	kg/batch	kg/kg MP
Main Section	1135593589	59768083,64	N/A
TOTAL	1135593589	59768083,64	N/A
Cooling Water	kg/yr	kg/batch	kg/kg MP
TOTAL	0	0	N/A
Steam	kg/yr	kg/batch	kg/kg MP
Main Section	1455832,1	76622,74	N/A
TOTAL	1455832,1	76622,74	N/A
Steam (High P)	kg/yr	kg/batch	kg/kg MP
TOTAL	0	0	N/A
1.1c Heat Transfer Agent Demand (Procedure Breakdown)			
Chilled Water	kg/yr	kg/batch	kg/kg MP



LCA methodology

Life Cycle Impact Assessment

- EF 3.1 method: climate change, marine, freshwater and terrestrial eutrophication, land use, water use and ecotoxicity

Interpretation

- Benchmark: fossil jet fuel and SAFs
- Sensitivity analysis:
  - Electricity grid projections for 2030 and 2050 (IEA)
  - Process efficiency



Main bottlenecks in LCA & TEA

- Scaling experimental results to pilot and industrial levels remains an important challenge
- Process performance and feedstock (isoprene/hydrogen) productivity require further validation
- Input costs, particularly for materials not yet produced at industrial scale, may need further assessment (catalyst)
- Additional experimental data will help refine the model behind the LCA and TEA, and inform future development priorities



WSP

Alfafuel deployment

Methodology





European Commission

Carbon price

<u>Carbon price scenarios</u>

Low carbon price scenario (Low price) scenario with limited deployment of hydrogen, not bound to the sub-mandates of ReFuelEU aviation

- **Evaluates deployment of Alfafuel in trajectory where decarbonization of the aviation is highly dependent of liquid low and zero emissions fuels**

High carbon price scenario (High price) scenario supporting increased replacement of kerosene blend form hydrogen – bound to the attainment of ReFuelEU aviation sub-mandates.

- **Evaluates the potential uptake of Alfafuel in a scenario trajectory with higher substitution of kerosene blend from hydrogen**

Alfafuel price

<u>Price competitiveness scenarios</u>

Base scenario: Price parity between **Alfafuel** and other RFNBO's

Price premium scenarios: Increased price of **Alfafuel** relative to other RFNBOs

- **Alfafuel price increasing gradually up to 10% (*relative to RFNBOs*) assessing the critical price range for deployment**

Price subsidy scenarios: Decreased price of **Alfafuel** compared to other RFNBOs

- **Alfafuel price decreasing gradually up to 50% (relative to RFNBOs) assessing required price to reach blending wall of 10%**

<u>ReFuel EU Aviation</u>

<u>Regulation Impact scenarios</u>

Relative increase of e-SAF sub-mandate post 2050 by,10%, 15% and 20%

- **These scenarios evaluate the impact of favoring policy mandates on Alfafuel deployment in the Aviation**

Analysis – Carbon Price Scenarios (1/2)

Low carbon price scenario

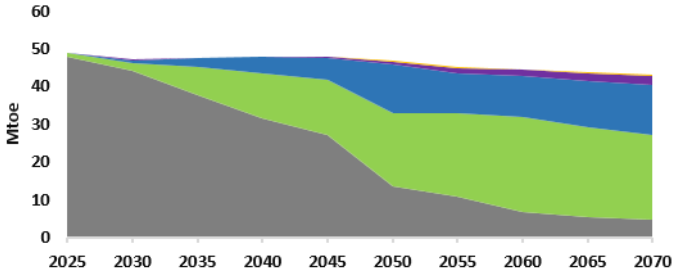
Moderate carbon price trajectory (*reaching approximately 190 Euro/tCO2 post-2050*)

- Decarbonization effort of aviation heavily reliant on liquid SAF (bio and synthetic)
  - Liquid SAF deployment increasing from 35% in 2040 to 70% and post-2050
  - Biokerosene is dominating the SAF blend post-2050

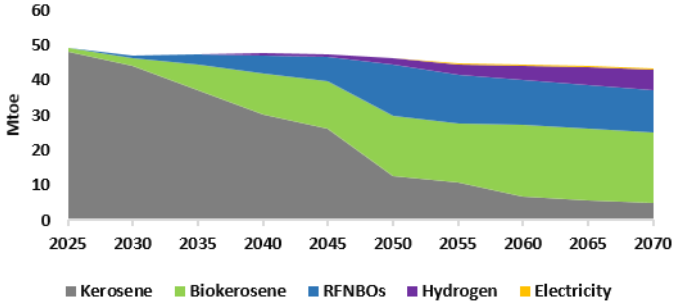
High carbon price scenario

- Higher carbon price trajectory supporting uptake of alternative fuels
- Increased penetration of hydrogen in the sector (almost triple the deployment compared of the Low carbon price scenario)
- The share of RFNBO's in SAF consumption increases in order to meet the RFNBO sub-mandate of ReFuelEU aviation

Evolution of aviation energy demand in the Low carbon price scenario by fuel



Evolution of aviation energy demand in the High carbon price scenario by fuel

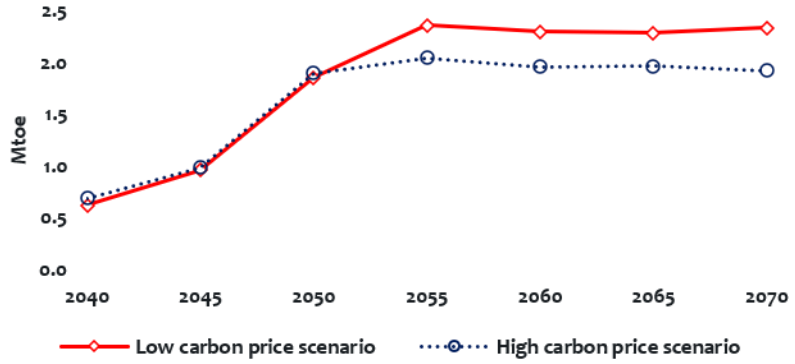


Analysis – Carbon Price Scenarios (2/2)

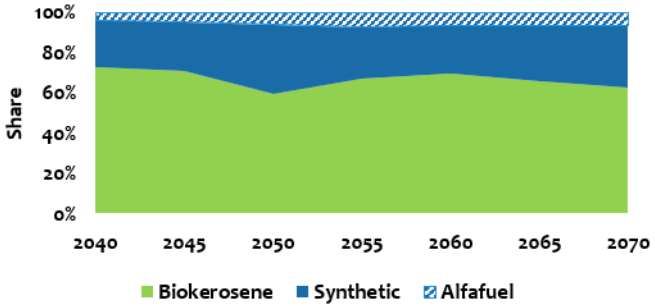
Alfafuel deployment in the carbon price scenarios under price parity conditions between synthetic RFNBOs and Alfafuel

- In both scenarios the share of **alfafuel** in the Liquid SAF blend maximizes at 6 % in 2050, remaining relative stable up to 2070
- In energy terms deployment in the Low carbon price scenario is maximizing at 2.4 Mtoe while the deployment in the High carbon price scenario maximizes slightly lower at 2.0 Mtoe.
- Alfafuel is projected to represent 4%-5% of aviation's total energy demand

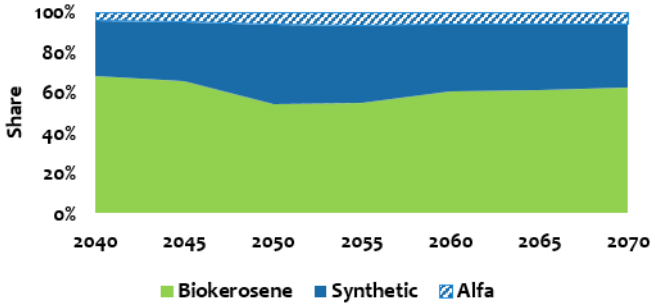
Evolution of Alfafuel deployment by scenario (price parity) in Mtoe



Evolution of liquid SAF deployment in the Low carbon price scenario by fuel (price parity)



Evolution of liquid SAF deployment in the High carbon price scenario by fuel (price parity)



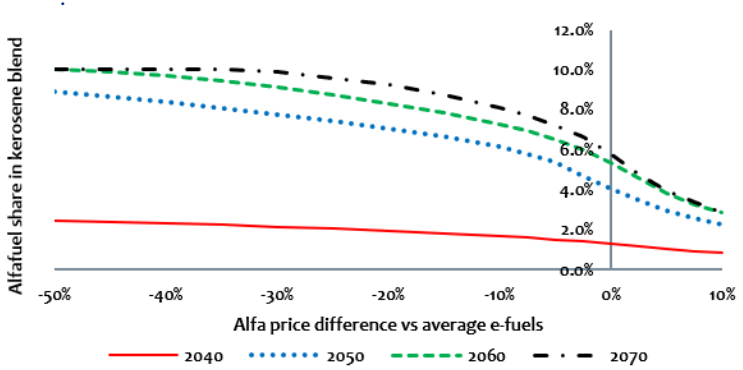
Analysis – Price Sensitivity (1/2)

Impact of price premiums and price subsidies in the uptake of Alfafuel

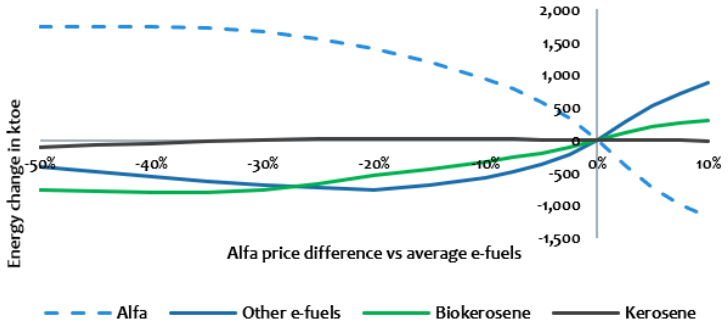
Price sensitivity analysis under Low carbon price scenario

- Alfafuel uptake is highly sensitive to its price relative to average competing e-fuels.
- 10% relative discount increases Alfafuel uptake by 700 – 900 ktoe post-2050 raising its share in kerosene blend from 6.5% (*price parity conditions*) to 8% in 2070
- A 10% relative price increase reduces uptake by 800 – 1200 ktoe post-2050, highlighting the deployment risk of pricing above competing e-fuels (*3% of kerosene blend in 2070*).
- Further discounts deliver diminishing incremental gains.
- Under the Low carbon price scenario lower prices of Alfafuel substitution of biokerosene surpasses substitution of e-fuels.
- In order for Alfafuels to reach its blending wall (i.e., 10% of kerosene blend) its price should reduce at infeasible price ranges

Relative increase of Alfafuel deployment by price in the Low carbon price



Substitution of SAF by Alfafuel price in the Low carbon price scenario



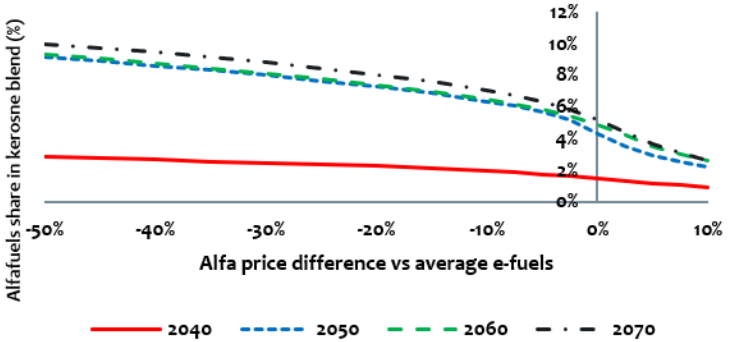
Analysis – Price Sensitivity (2/2)

Impact of price premiums and price subsidies in the uptake of Alfafuel

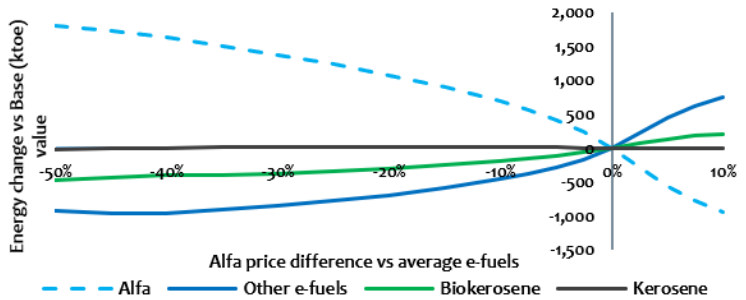
Price sensitivity analysis under the High carbon price scenario climate scenario

- Price sensitivity is visible also under the High carbon price scenario assumptions
- 10% relative discount increases uptake by 600-700 ktoe post-2050 (*slightly lower compared to the Low carbon price scenario*)
- A 10% relative price increase reduces uptake almost 900 ktoe post-2050.
- The High carbon price scenario is characterized by lower price sensitivity compared to the Low carbon price, due to limited bioSAF substitution.
- Alfafuel mainly compete with e-fuels as biokerosene is bound by its own sub-mandate under ReFuel EU Aviation
- In order for Alfafuel to reach its blending wall (i.e., 10% of kerosene blend) its price should reduce by almost 40-50% compared to the competitive e-fuels (*infeasible price range*)

Relative increase of Alfafuel deployment by price in the High carbon price scenario



Substitution of SAF by Alfafuel price in the High carbon price scenario



Analysis – ReFuel EU Aviation

ReFuelEU Aviation blending mandates by year

Year	SAF share	Bio-SAF share	RFNBOs share
2025	2%	-	–
2030	6%	4.8%	1.2%
2032	6%	4.0%	2.0%
2035	20%	15.0%	5.0%
2040	34%	24.0%	10.0%
2045	42%	27.0%	15.0%
2050	70%	35.0%	35.0%

Assummed mandates post 2050

- **SAF share: 72.5% in all scenarios**

Bio-SAF share

- Base 35%
- Scen I 31.25
- Scen II 29.37
- Scen III 27.5

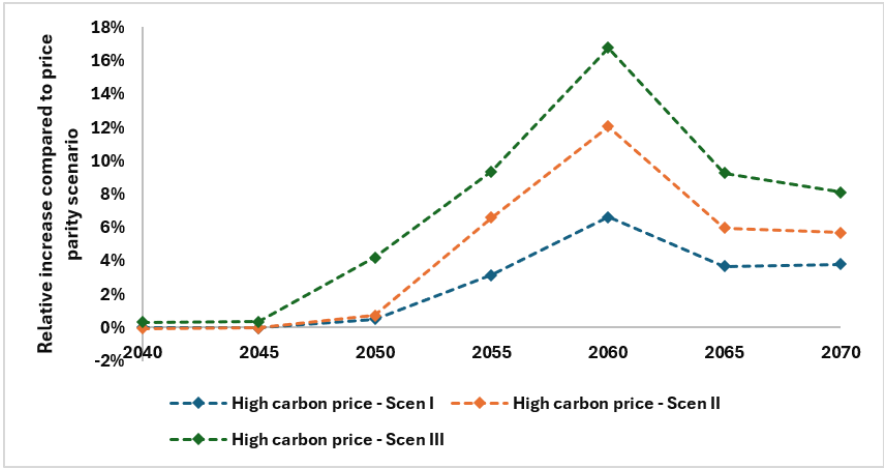
RFNBOs share

- Base 37.5%
- Scen I 41.25%
- Scen II 43.13%
- Scen III 45.0%

Note: Base scenario refers to the Low carbon price scenario with price parity between Alfafuel and other e-fuels

- This analysis is conducted only for the High carbon price scenario, as the Low price scenario is not bound to the ReFuelEU sub-mandates attainment
- In the High carbon price scenario, the increased blending mandate leads to increased Alfafuel deployment compared to the price parity conditions
- The scenario result indicate the importance of supporting regulations for the deployment of novel sustainable aviation fuels, especially under not favorable price conditions for Alfafuels

Relative increase of Alfafuel deployment by level scenario, compared to the High carbon price scenario (price parity conditions)



Key findings

- Alfafuel uptake depends on competitiveness, not just decarbonization ambition.
- A stronger push towards e-fuels does not necessarily translate into greater demand for Alfafuel, as competing pathways may capture the growth.
- Competitive pricing is a key lever for increasing uptake, while higher costs can substantially limit adoption.
- Initial uptake does not guarantee sustained growth - maintaining competitiveness matters as the fuel mix evolves.
- Overall, policy support creates the opportunity while Alfafuel's relative competitiveness determines how much of that opportunity it captures.

Next steps

- Integrate any available feedback from the WS and the consortium
- Incorporate final technoeconomic results of the TEA and LCA in the enhanced PRIMES model
- Design the scenario framework to assess the potential uptake of Alfafuel (Dec 2027)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