
ANDREA
by Hinicio
WELCOME TO OUR WEBINAR
DESIGNING A RFNBO COMPLIANT SYSTEM WITH ANDREA BY HINICIO
We'll be starting shortly

Webinar agenda

5 min

Integrated PtX System Design

35 min

Using ANDREA for designing a RFNBO compliant system

- How a basic optimization looks like and its limitations
- What does it take and how to design a 100% RFNBO compliant system.
- Improving your business case by increasing your production by targeting different markets

5 min

Strategic Opportunities

Hinicio

Juan Zuñiga

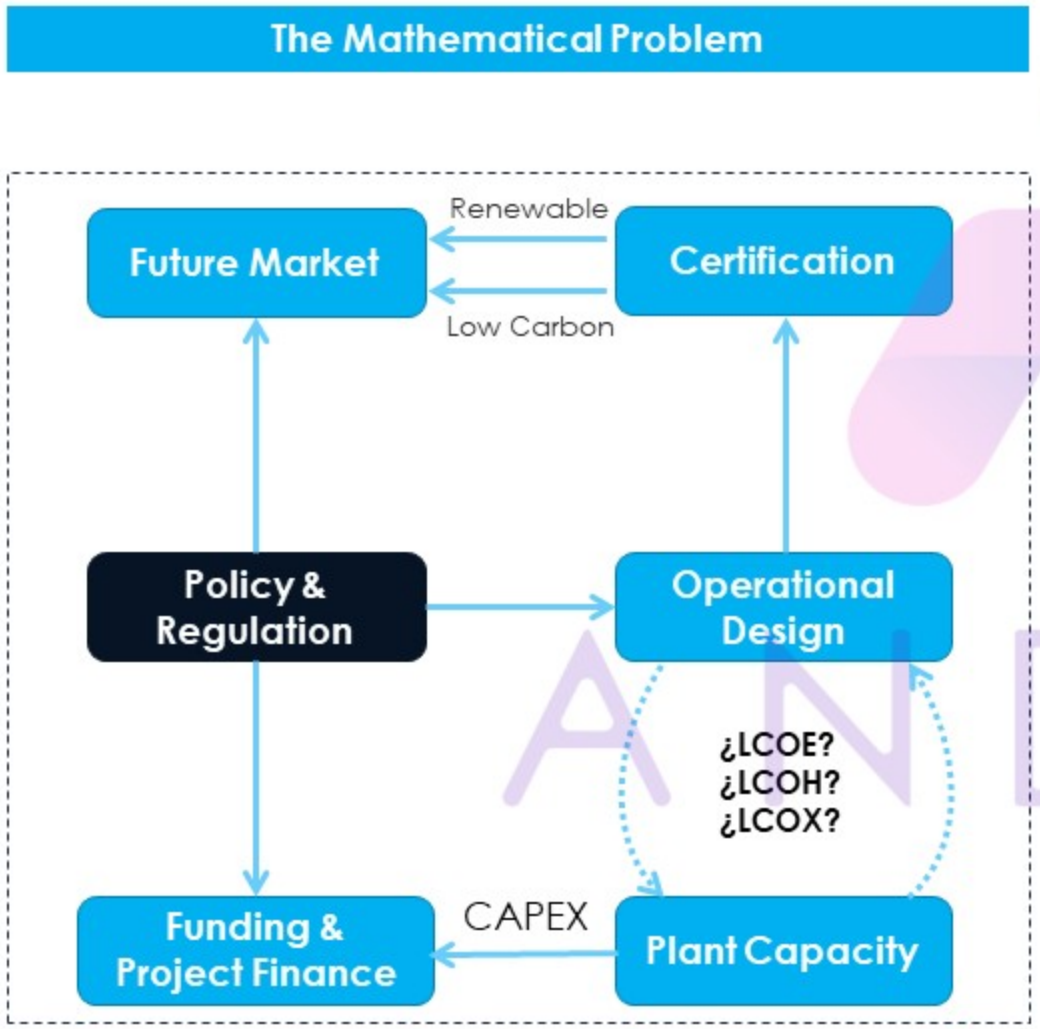
Head of Engineering

Andres Fuenzalida

Optimization Expert
Hinicio

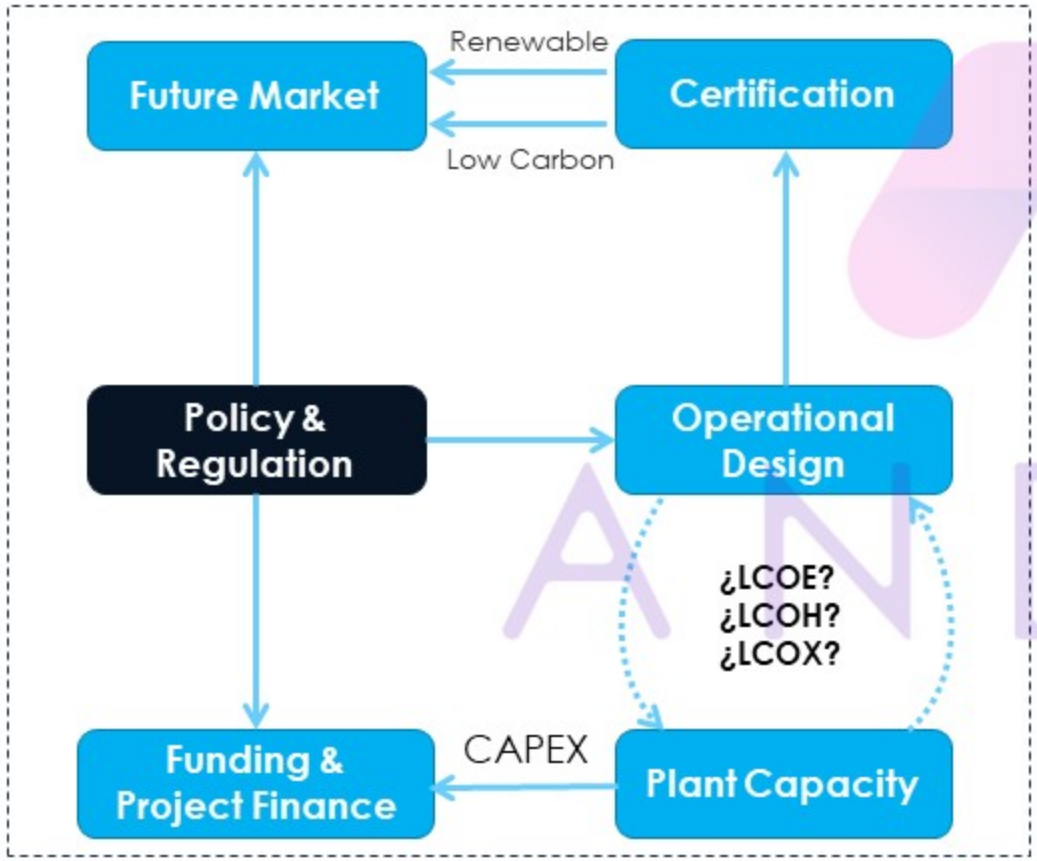
An Integrated Approach

TODAY'S SHIFTING REGULATIONS, MARKETS, AND TECHNOLOGIES DEMAND AN INTEGRATED APPROACH

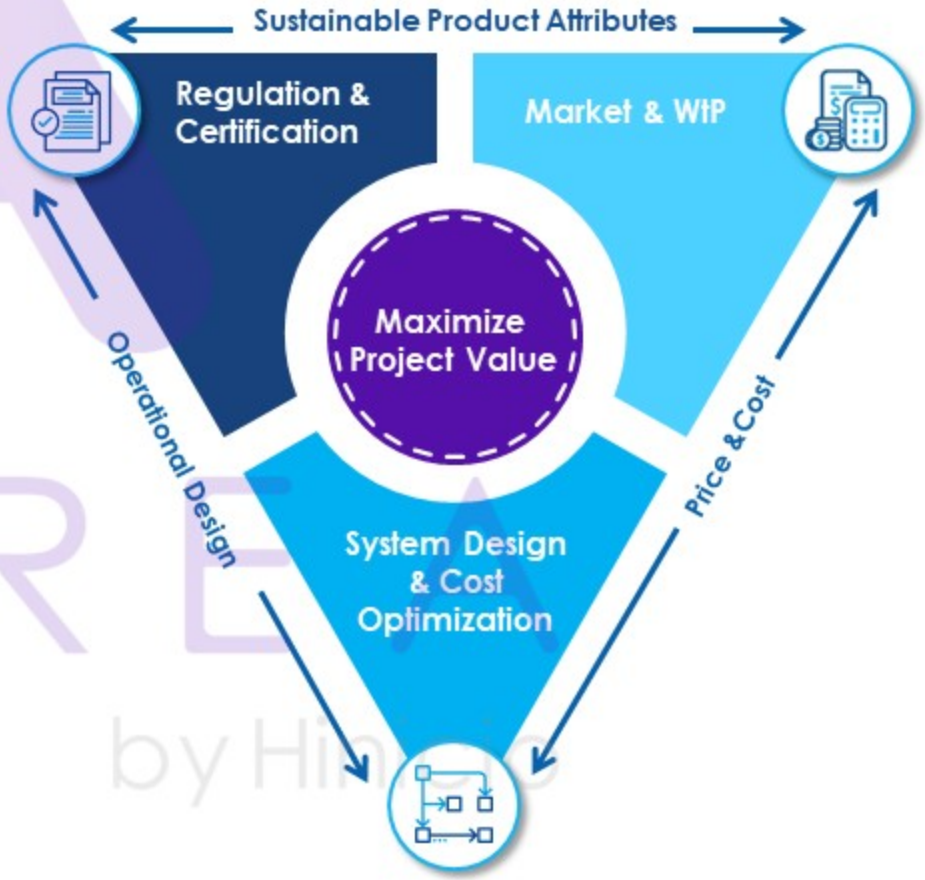


WHAT REALLY MATTERS IS MAXIMIZING VALUE

The Mathematical Problem

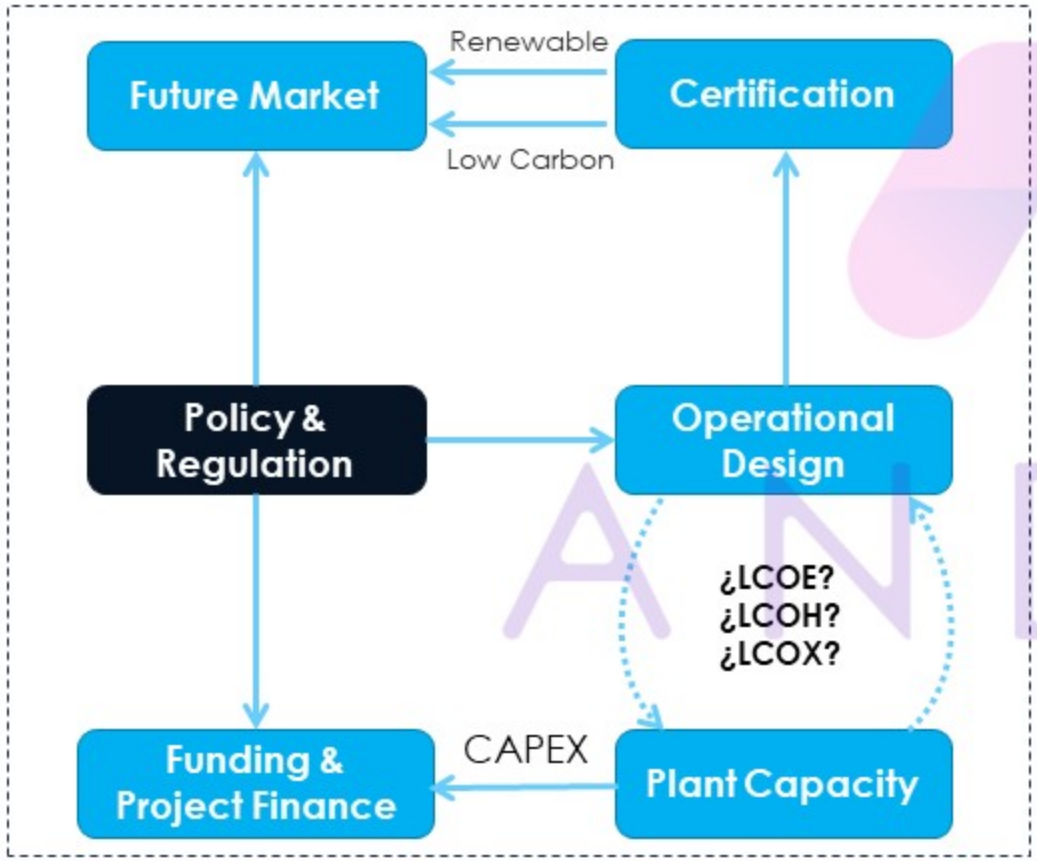


Our Approach: Methods + Software

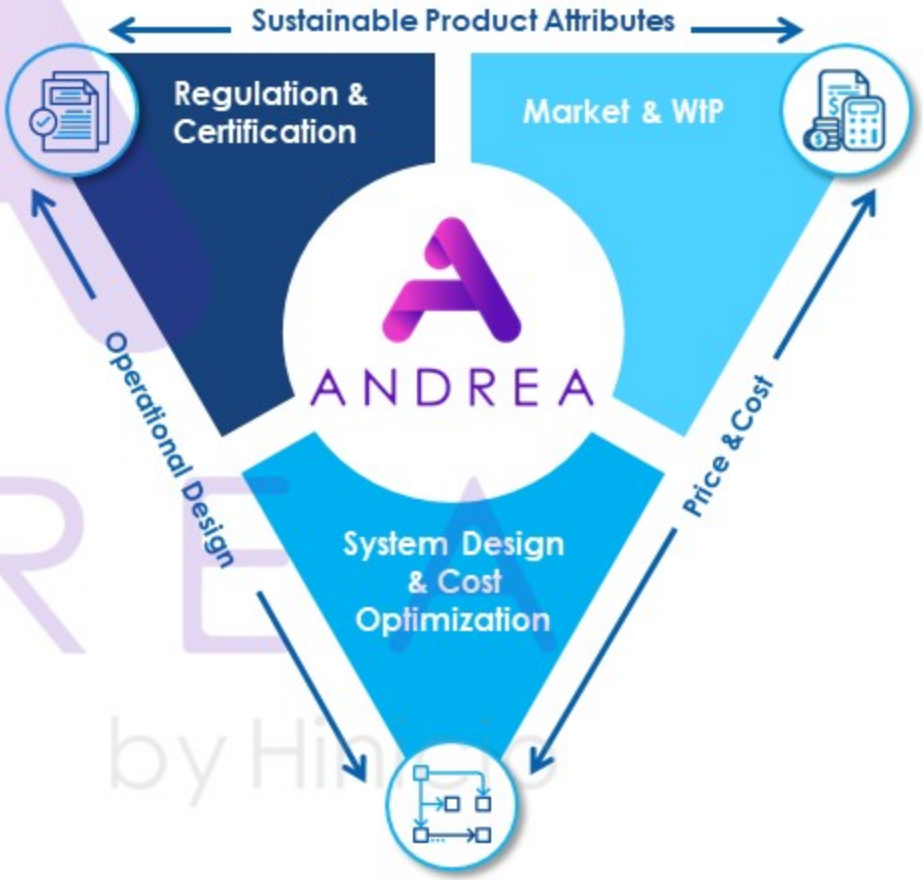


WHAT REALLY MATTERS IS MAXIMIZING VALUE

The Mathematical Problem



Our Approach: Methods + Software



Some key concepts

MARKETS FOR RENEWABLE MOLECULES ARE REGULATORY-DRIVEN AND REQUIRE A COMPREHENSIVE SET OF CONDITIONS TO MATERIALIZE

Developing a set of regulatory-driven conditions … → **… to create market conditions and economic reality**

TO BE RED[1] COMPLIANT, A RFNBO[2] MUST MEET THREE CRITERIA: RENEWABLE ORIGIN, AT LEAST -70% IN CFP[3] COMPARED TO THE FOSSIL, AND BE HANDLED BY CERTIFIED ECONOMIC OPERATORS

A RED COMPLIANT RFNBO MUST:

- Fulfill the criteria for renewability and GHG emissions reduction compared to fossil.
- Be produced and handled by economic operators certified against a recognized Voluntary Scheme relying on Mass Balance

1

RENEWABILITY

All relevant energy inputs, including electricity consumed by the electrolyser, should be renewable.

+

2

70% EMISSIONS REDUCTION

The RFNBOs should achieve at least 70% of GHG emissions reductions compared to its fossil fuel comparator on a well-to-grave scope.

+

3

CERTIFICATION

The RFNBOs should be produced and handled across the value chain by certified economic operators under a recognized Voluntary Scheme.

[1]*RED= Renewable Energy Directive*
[2]*RFNBO= Renewable Fuel of Non-Biological Origin*
[3]*CFP= Carbon Footprint*

Case Study

STUDY CASE: EXPORTING 1 MTPA OF AMMONIA FROM CHILE TO HAMBURG FOR H2 GLOBAL IN 2030

73% EMISSIONS REDUCTION FOR H2GLOBAL

Hintco requests for at least 73% GHG emissions savings at the delivery point in Germany or the Netherlands. This is because the bidder delivers the product in the respective delivery point in Europe, and emissions from transporting the RFNBO to the point of final use must be accounted and achieve REDII 70% emission savings.

Cases to be analysed:

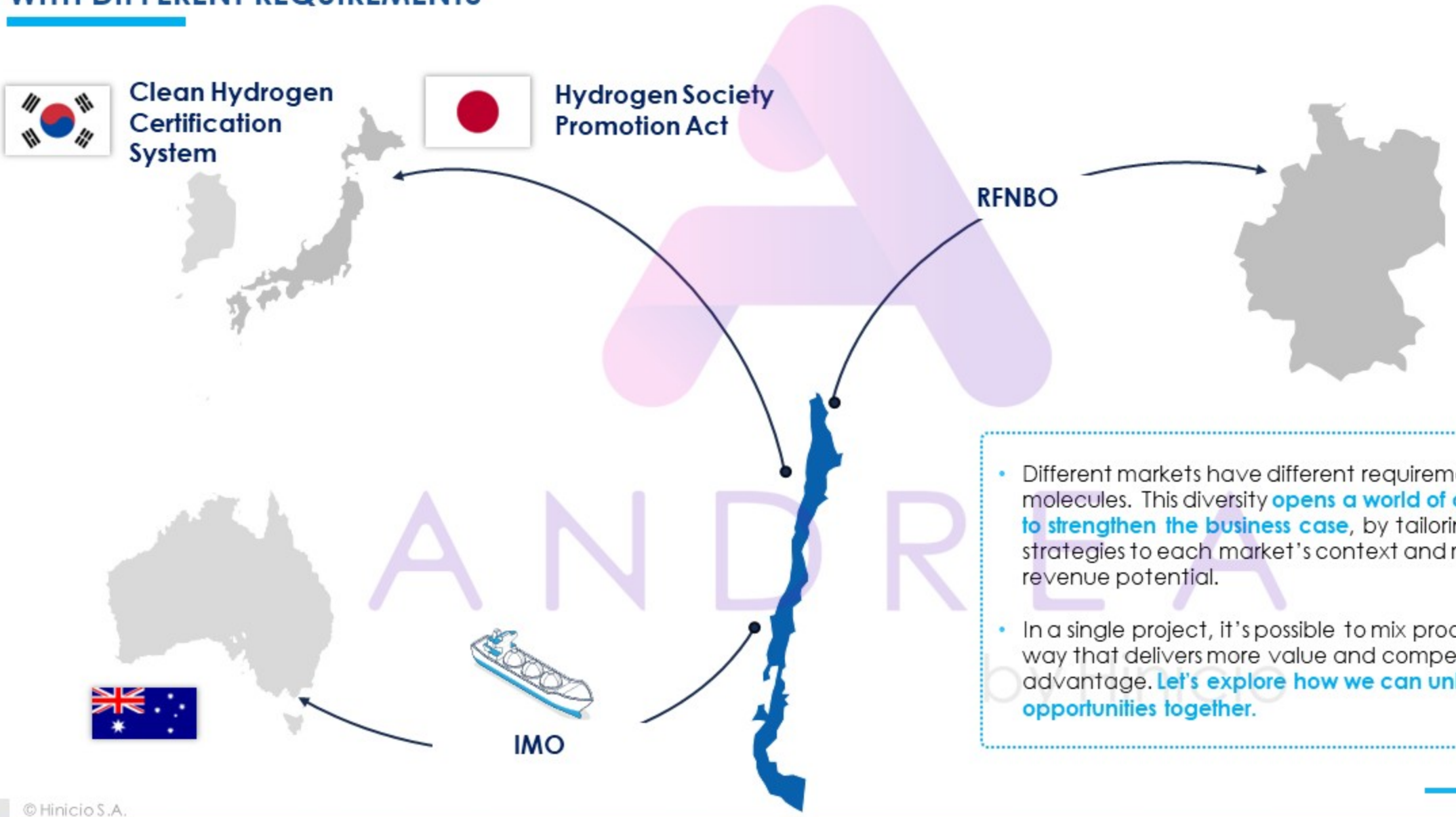
1. **Base Case**
   - Business as usual: Techno-economic optimization with no regulatory constrains considered
2. **100% Production (1 MTPA) RFNBO complaint for H2 Global**
   - Optimization considering regulatory constrains
3. **Product Slate Expansion:**
   - Complement the RFBNO production with conventional ammonia for local demand to improve the business case.

Main assumptions:

- Ammonia RFNBO price: **1000 EUR/ton** (H2 Global)
- Local demand price: **450 EUR/ton** (S&P Global)

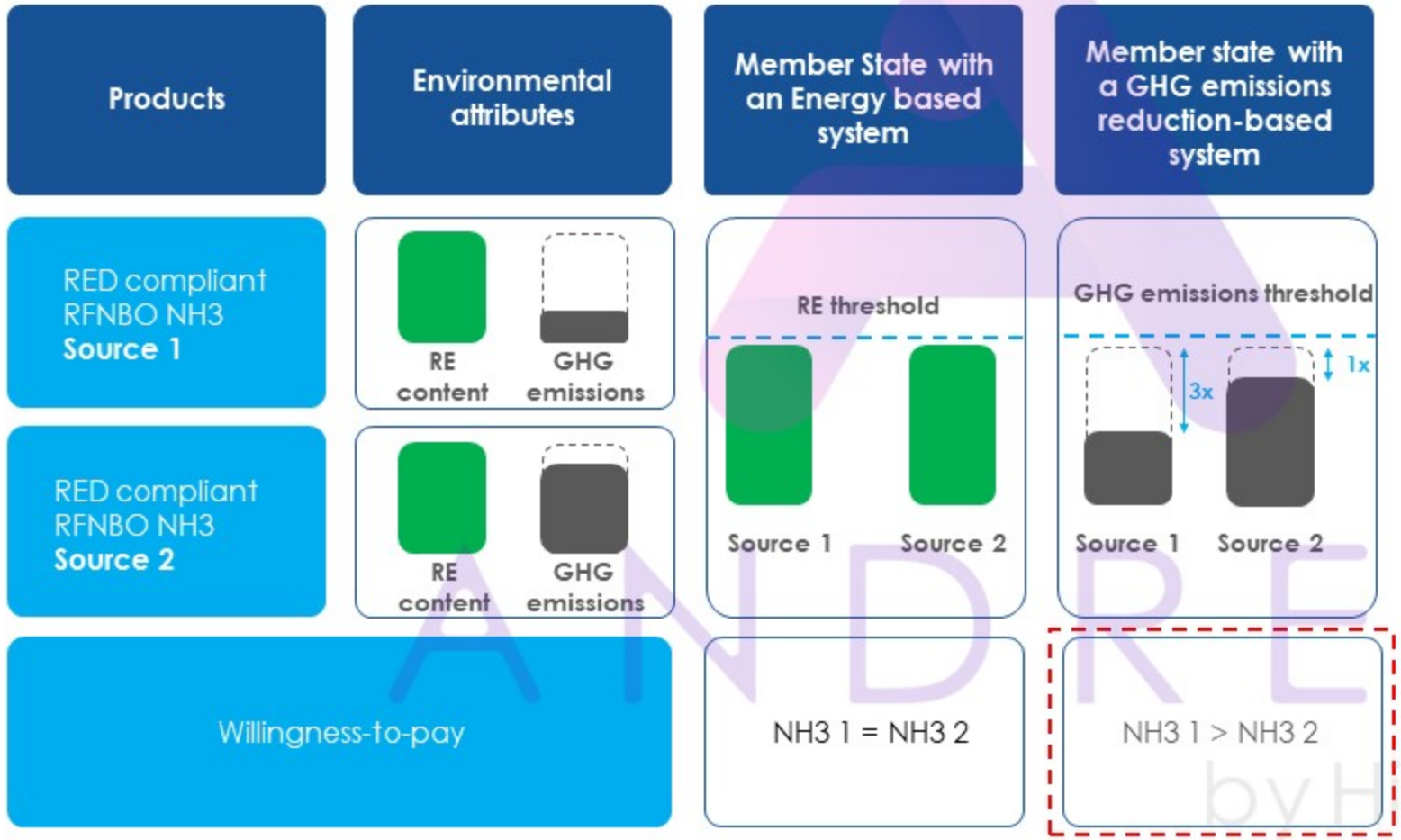
Strategic Opportunities

IT IS LIKELY THAT THE OPTIMAL DESIGN WILL COVER A VARIETY OF DIFFERENT END-MARKETS WITH DIFFERENT REQUIREMENTS



- Different markets have different requirements for clean molecules. This diversity **opens a world of opportunities to strengthen the business case**, by tailoring production strategies to each market's context and maximizing revenue potential.
- In a single project, it's possible to mix production in a way that delivers more value and competitive advantage. **Let's explore how we can unlock these opportunities together.**

SOME EUROPEAN MARKETS WILL VALORIZE EXTRA-PERFORMING RFNBO WITH LOWER GHG EMISSIONS OPENING MORE OPTIONS FOR OPTIMIZATION



Key takeaway

- European Member States can decide to opt in for an energy-based or GHG-emissions reduction based target for RFNBO.
- The value of RFNBO molecules will depend on the decision each country makes.
- Based on the environmental attribute of its molecules, producers should target different markets:
  - Compliant molecules with GHG emissions close to the threshold should be sent to energy-based markets.
  - Molecules with low GHG emissions should target GHG emissions-based markets where their attributes can be best valorised.

ANDREA
by Hinicio

WANT TO GET MORE INFORMATION?

Sign up to get more information about ANDREA & Augmented consulting and get a free trial[1]

https://hinicio.com/andrea/

[1]Limited spots available

Experts decarbonizing the hardest-to-abate sectors. **Now!**

Juan Zuñiga
Head of Engineering
Juan.zuniga@hinicio.com

Andres Fuenzalida
Optimization Expert
Andres.fuenzalida@hinicio.com

Hinicio

Badajoz 45, oficina 1501, 7560908 Las Condes, Región Metropolitana, Chile

info@hinicio.com

www.hinicio.com

/company/hinicio

HinicioSA

BEST HYDROGEN INDUSTRY SERVICE PROVIDER
Latin America
H2LAC 2024 Industry Awards

BEST SUSTAINABLE ENERGY CONSULTING FIRM
2023 – Colombia
2023 Global Business Awards

HINICIO RECOGNIZED AS A GLOBAL TOP HYDROGEN CONSULTANCY FIRM
2023
Reuters Top 100 Innovators in Hydrogen 2023

BEST HYDROGEN INDUSTRY SERVICE PROVIDER IN LATIN AMERICA
Industry Award H2LAC 2022
H2LAC 2022 Industry Awards

CERTIFHY WON THE FCH JU'S BEST SUCCESS STORY AWARD: TOWARDS A SUSTAINABLE AND CIRCULAR HYDROGEN ECONOMY
Clean Hydrogen JU Awards 2022

HINICIO AMONG FUTUROLOGY'S 17 MOST INNOVATIVE RENEWABLE ENERGY COMPANIES
Futurology 2021 Most Innovative Brussels Based Renewable Energy Companies & Startups

Hinicio

Experts decarbonizing the hardest-to-abate sectors. **Now!**

www.hinicio.com /company/hinicio HinicioSA

Hinicio HQ - Belgium

Bd Saint-Lazare 4/10
1210 Brussels, BE

info@hinicio.com

Hinicio Netherlands

Weena 788,
3014 DA Rotterdam, NL

info@hinicio.com

Hinicio Chile

Badajoz 45, Las Condes
7560908 Santiago, CL

chile@hinicio.com

Hinicio France

92, avenue Charles de Gaulle
92200 Neuilly-sur-Seine Paris, FR

paris@hinicio.com

Hinicio Colombia

Cl. 72A #5-83,
110221 Bogota, CO

colombia@hinicio.com