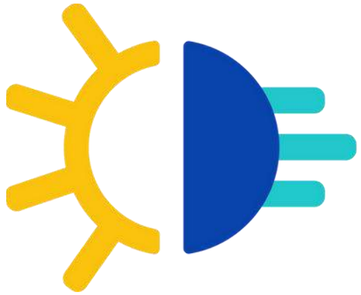


HydRoad

Emission-Free Energy Network to Meet your Complete Local Energy Demand

Our Mission

SUPPLYING 100% OF CONSUMPTION
WITH CLEAN RENEWABLE ENERGY

HydRoad

Fuel & Electricity

24/7/365

Wherever Needed

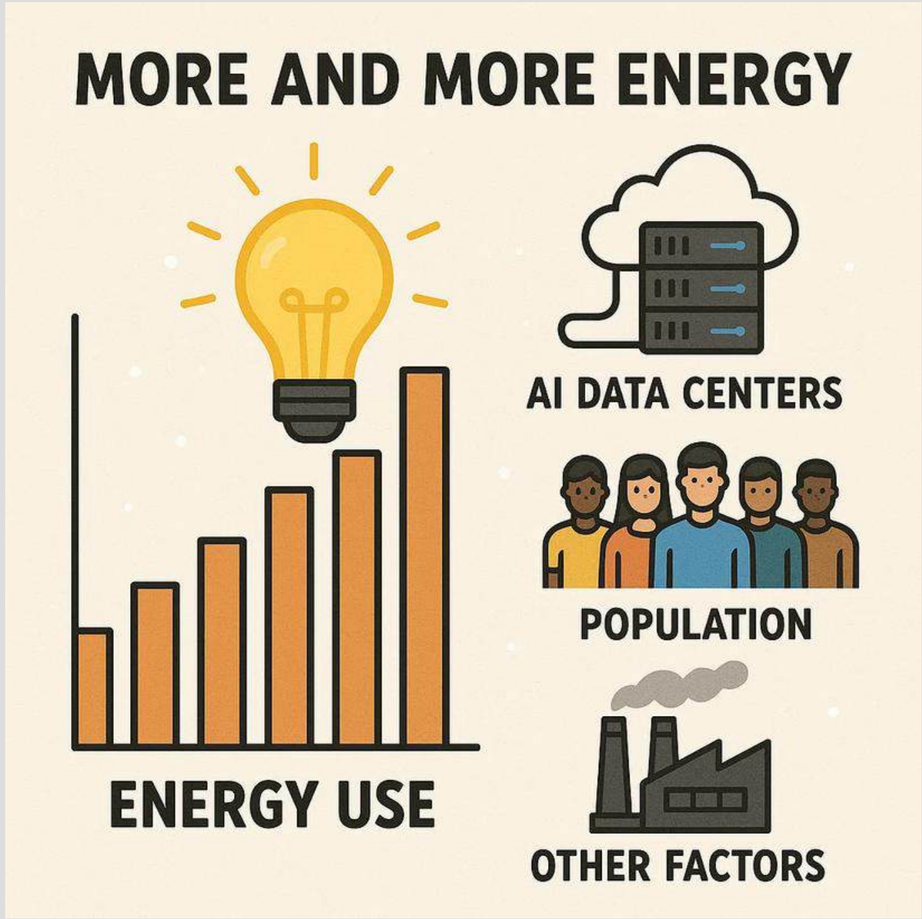
WHY SHOULD YOU CARE?

ENERGY = LIFE.

Energy powers our economy.

We are all dependent on it for the necessities of modern life.

The demand is constantly rising, even when the prices go up!



BUT…

MOST OF THE CURRENT ENERGY SOURCES ARE:

Finite

Harmful &

Beyond Our Control

Fortunately, a wide variety of renewable sources & technologies is available, & cheaper than ever!

PRODUCTION

CONSUMPTION

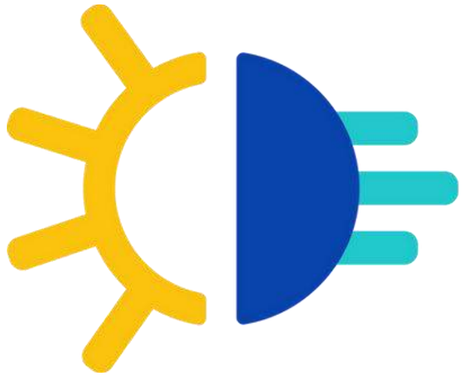
So, why are we still so dependent on Fossil fuels?

Because the Infrastructure Needed to Deliver Energy from Producers to Consumers is Insufficient & Costly!

The Critically Over Looked Bottleneck is Connectivity

PRODUCTION — — — — — CONSUMPTION

AND THIS IS EXACTLY THE GAP
WE ARE HERE TO FILL

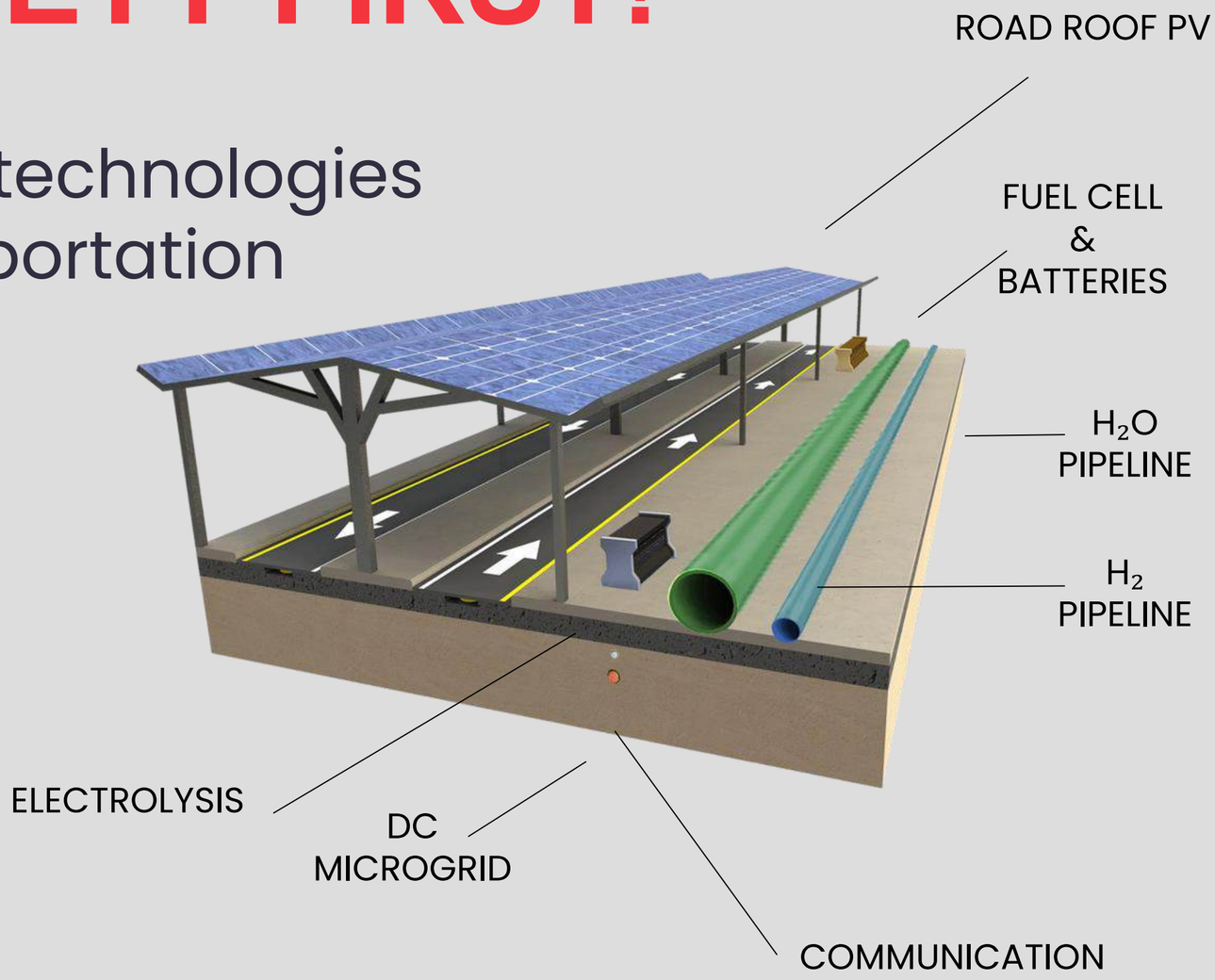


HydRoad

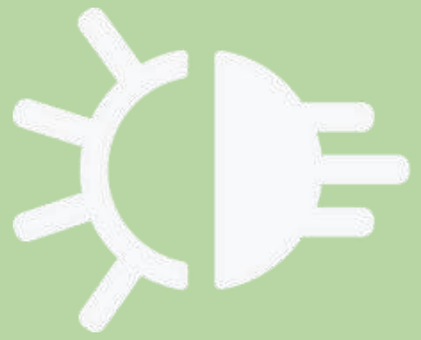
HOW? SAFETY FIRST!

By integrating the right technologies with existing land transportation systems to enable a 360° solution

- Fuel & electricity
- All year long
- Zero CO_2



Delivering
Local Energy Independence
via
Scalable Cost-Effective Infrastructure



SOURCE

Solar
Electricity

STORAGE

Hydrogen
Pipeline

SUPPLY

Hydrogen
& Electricity

HydRoad

WHY ROADS?

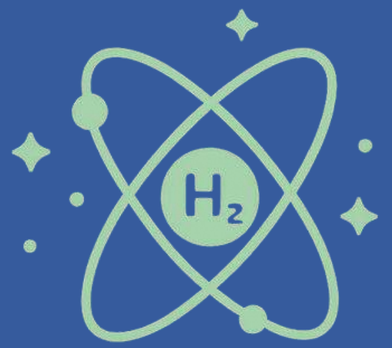
A LOT OF SPACE

AVAILABLE & ACCESSIBLE

UNIFORM, MODULAR & SCALABLE

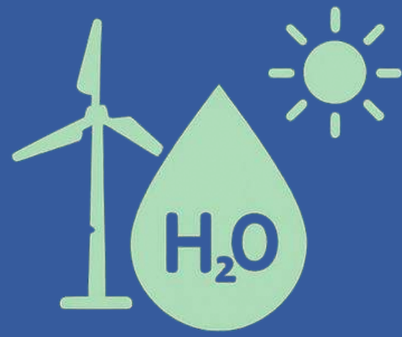
INTECONNECTED GRID

WHY HYDROGEN?



ABUNDANT

WATER to WATER



RENEWABLE SOURCES

POWER STORAGE

HydRoad

The Bottom Line is that

TOGETHER THEY DELIVER BETTER RESULTS

Save 60% on Infrastructure Costs

Renewable Fuel & Electricity

Reduce Harmful Electronic Waste

One Scalable Solution

WHO ARE WE?

Dr. Avraham Arbel
CTO

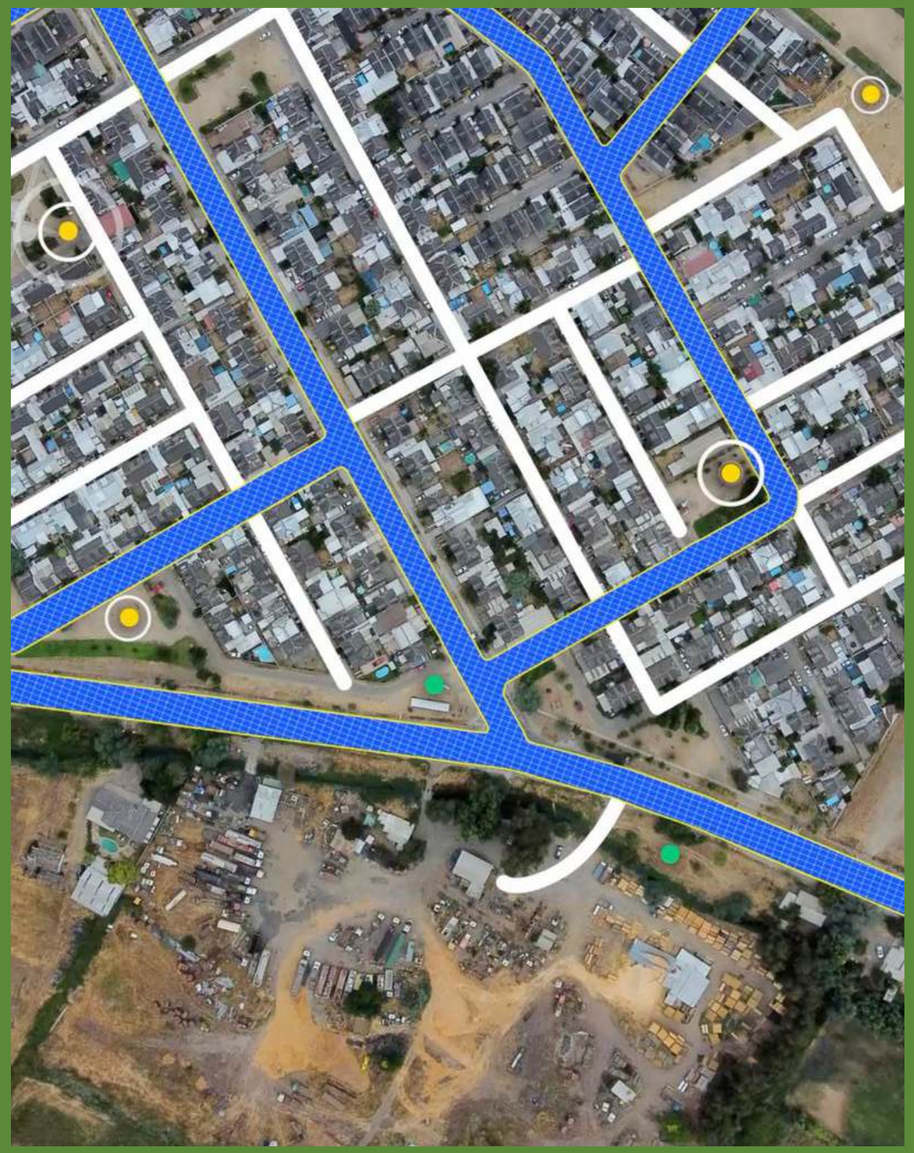
- Ph.D. in Mechanical Engineering, Tel Aviv University
- Scientist of the Year 2011, ARO Institute
- Inventor of DryGair

Tamar Arbel
CEO

- B.Sc. in Physics & Philosophy, Tel Aviv University
- Heschel Program for Environmental Leadership graduate
- 2025 Green Economy Award for Promising Young Leaders

WHAT DO WE DO?

Process
Engineering
& Software
Solutions



1

Planning
to meet your local energy needs

2

Management
of Local Energy Assets

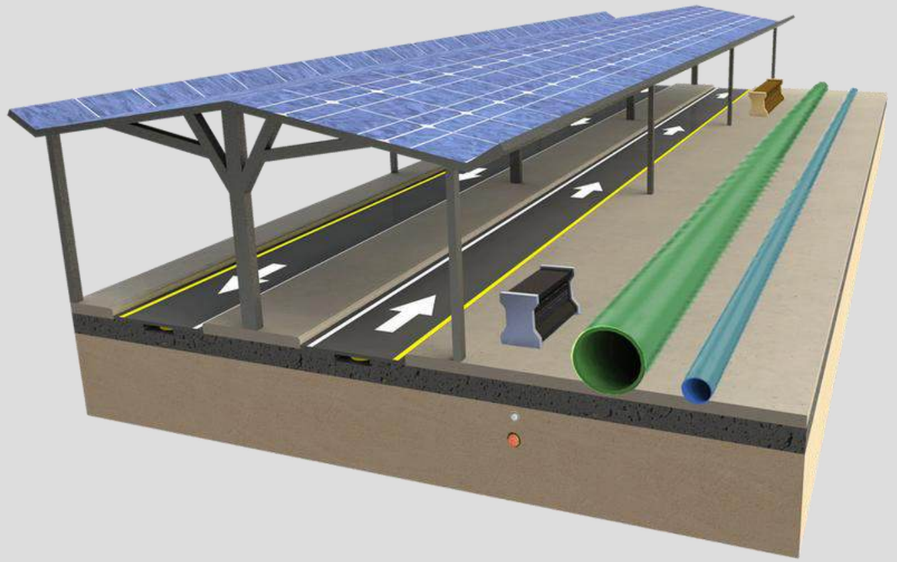
3

& Control
of the system operation

LET’S LOOK AT THE NUMBERS...

We calculate a mid-range cost of $10-12M for 1 km in length

Including the complete HydRoad system,
deployed on a road of ~12m wide,
with solar radiation at ~30° latitude
involving a pipeline at ~35 bar pressure



Production Capacity per Year:

Electricity = 405 Households (10,800 kWh/day, in USA)

Hydrogen = 1 Million km/y of a Fuel Cell Truck (9 kg/100 km carrying 33 tons of goods).

HOW MUCH CAN WE PRODUCE FROM 1 KM?

Belém, Brazil

(Latitude ~0◦)

4,789 MWh per year

= 2,156 Households

102 tons of H_2 per year

= 1,133,333 km

Dimona, Israel

(Latitude ~30◦)

4,381 MWh per year

= 654 Households

93 tons of H_2 per year

= 1,033,333 km

London, England

(Latitude ~50◦)

3,558 MWh per year

= 474 Households

76 tons of H_2 per year

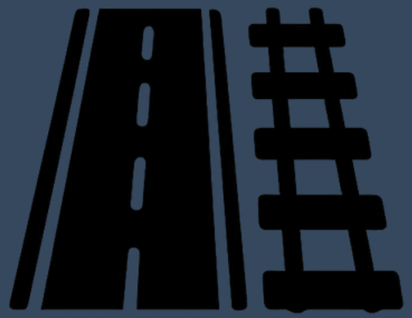
= 844,444 km

WHERE SHOULD WE START?

Fuel-dependent Industries

With an Incentive for Renewables

Need for Operational Continuity



New Road or Rail Projects

WHEN?

2025

2050

In Terms of Energy Infrastructure, 2050 is Just Around the Corner

LEADING THE WAY, STEP BY STEP...

2025

- National phase patent
- Design Partner Search
- Fund-Raising

2026

- Development
- Establishing Partnerships
- Planning a Pilot Project
- Fund Raising

2027

- Executing Pilot
- Regulation Formatting

2028

- R&D for Scale-Up
- Planning a Commercial project

2029

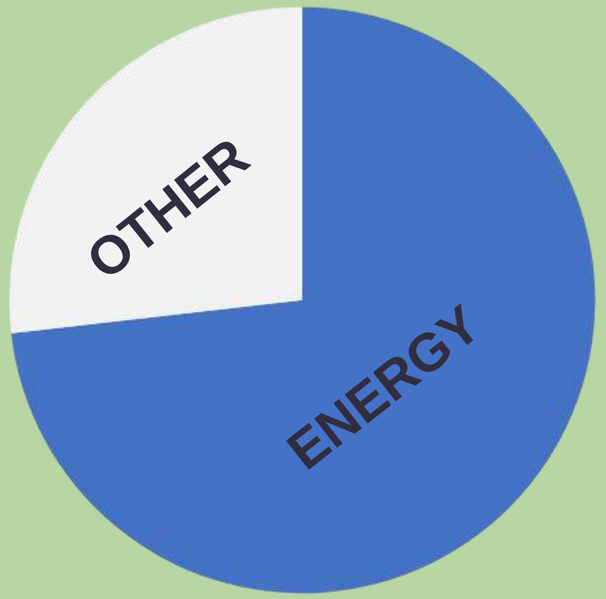
- Execution of a Commercial project

CLIMATE IMPACT of 1 km

(12m Wide)

1 km Saves 2,400 tons
CO_2 Emissions per year

1 km Saves 6 tons
Electronic Waste per year



GREENHOUSE GAS EMISSIONS

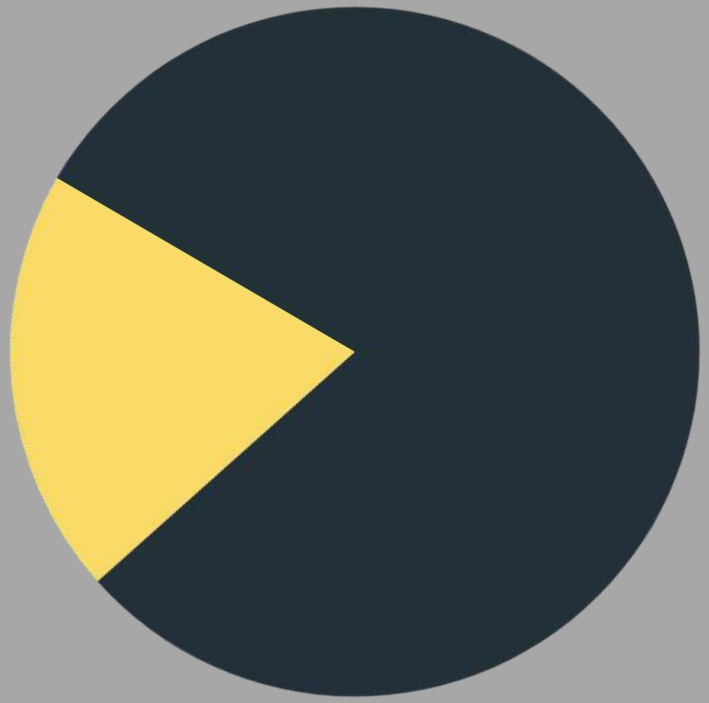
HydRoad

SAVING UP TO AT LEAST 60% ON INFRASTRUCTURE COSTS COMPARED TO COMPETITION

But what is the “competition”?

Competing Models are Focused on Flipping The Consumption Pie

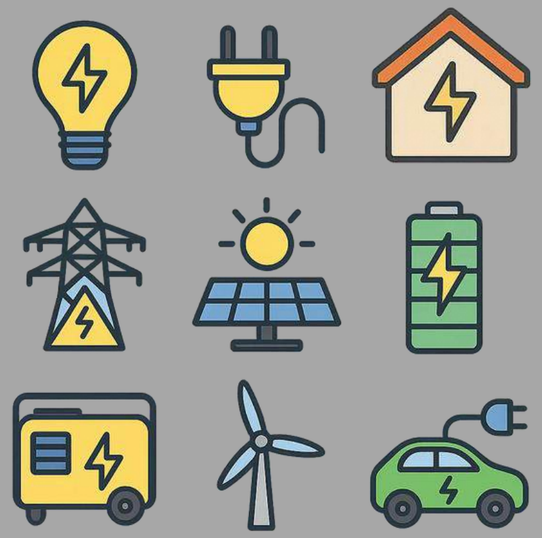
ELECTRICITY



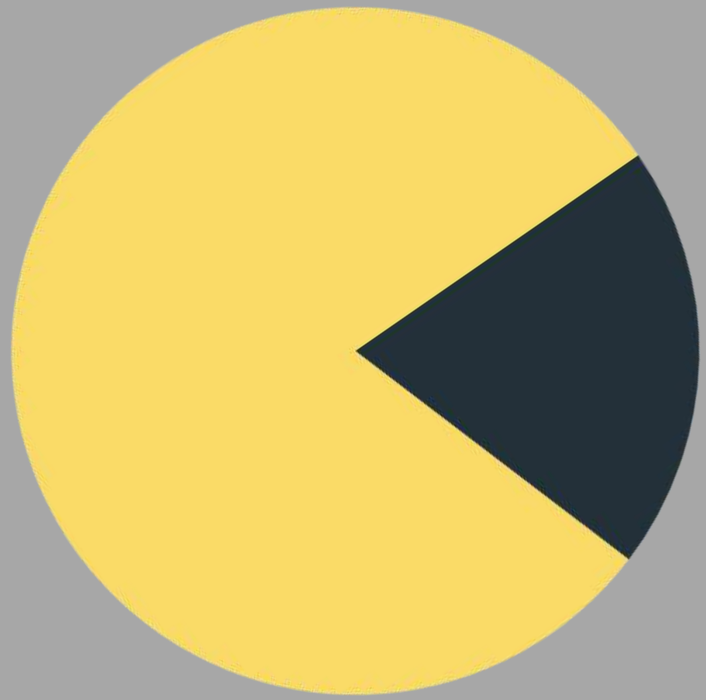
FUEL

Energy Consumption at the Final User Scale

to Include Mainly Electricity, AKA: “ELECTRIFICATION”



Abundant Renewable Electricity Options

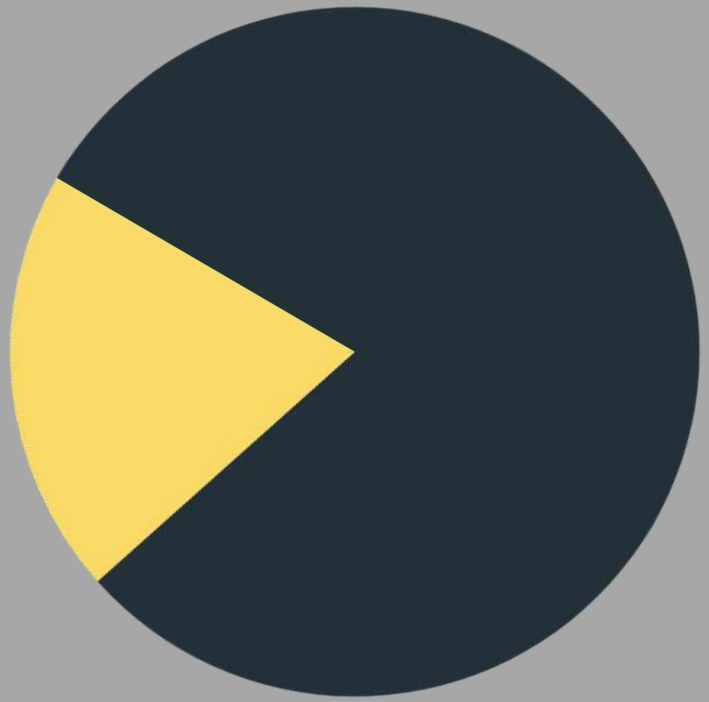


“Energy Consumption at the Final User Scale”

Limited Renewable Fuel Options

While the Global Reality we are Facing Remains:

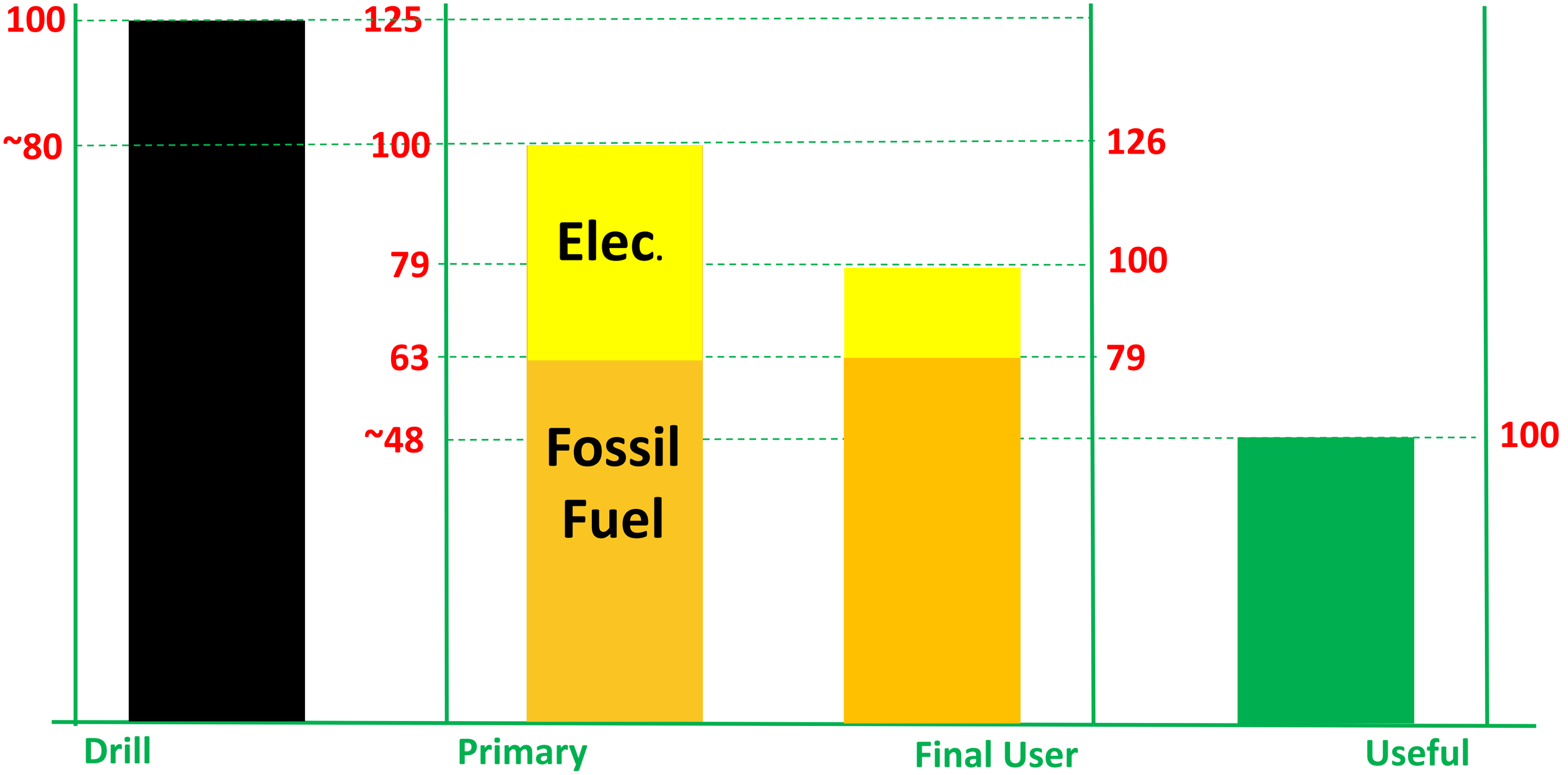
ELECTRICITY



FUEL

Energy Consumption at the Final User Scale

Global energy consumption - 2021



PURE “ELECTRIFICATION” SCENARIO

(η=81%)

Concentrated Solar & Wind Plants → DC2AC (η=95%) → Current*(5)*5 Transmission Grid (η=90%) → Current*(5) Distribution Grid (η=95%) → 100% Electrical consumer

100%

Eq. = ~ 123%

Eq. = ~ 98%

Fuel = ~ 126%

There is no long-term storage possibility!

BEV (η=73%)

CENTRALIZED “HYDROGEN” SCENARIO

Concentrated Solar & Wind Plants → DC2AC (η=95%) → T. Grid (η=90%) → AC2DC (η=95%) → Electrolyzes (η=80%) → Hydrogen Compressed (η=85%) → Hydrogen Transfer (η=90%)

Current*(5)*5*2

→ H2 (η=50%)

→ FCEV (η=25%)

→ ICM (η=13%)

~ 200%

Eq. = ~ 159%

Fuel = ~ 126%

Fuel = ~ 126%

HydRoad

8%

DC Distribution Micro-Grid

20% Electrical consumer

(η=100%)

100%

Distributed Solar Road PV

12%

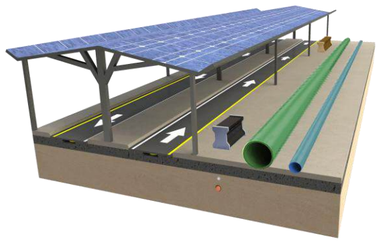
Fuel cell

Electrolyzes

92%

Low pressure, Sink & Source Hydrogen Pipes system

80% Hydrogen consumer



Long term storage

Fuel = ~ 126%

Eq. = ~ 115%

HydRoad

8%

DC Distribution Micro-Grid

20% Electrical consumer

~ 145%

100%

(η=100%)

Distributed Solar Road PV

(η=69%)

12%

Fuel cell (η=43%)

Electrolyzes

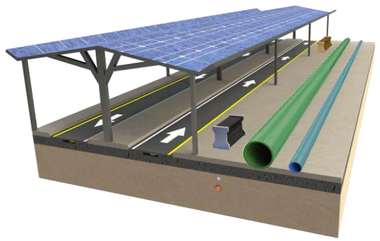
(η=73%)

92%

Low pressure, Sink & Source Hydrogen Pipes system

80%

Hydrogen consumer



(η-98%)

Long term storage

“Pessimistic” Efficiency Calculation

Fuel = ~126%

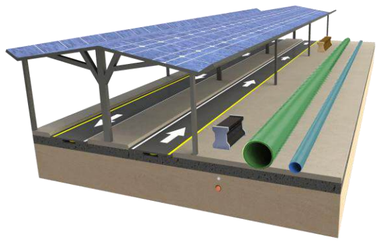
Eq. = ~105%

HydRoad

~132%

100%

Distributed Solar Road PV



8%

(η=100%)

DC Distribution Micro-Grid

20% Electrical consumer

(η=76%)

12%

Fuel cell (η=50%)

Electrolyzes

92%

(η=80%)

Low pressure, Sink & Source Hydrogen Pipes system

(η-98%)

80% Hydrogen consumer

Long term storge

Commercial Efficiency Calculation

Fuel = ~ 126%

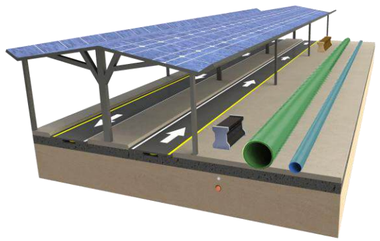
Eq. = ~ 87%

HydRoad

~ 110%

100%

Distributed Solar Road PV



8%

(η=100%)

DC Distribution Micro-Grid

20% Electrical consumer

12%

Fuel cell (η=60%)

(η=89%)

Electrolyzes

(η=95%)

92%

Low pressure, Sink & Source Hydrogen Pipes system

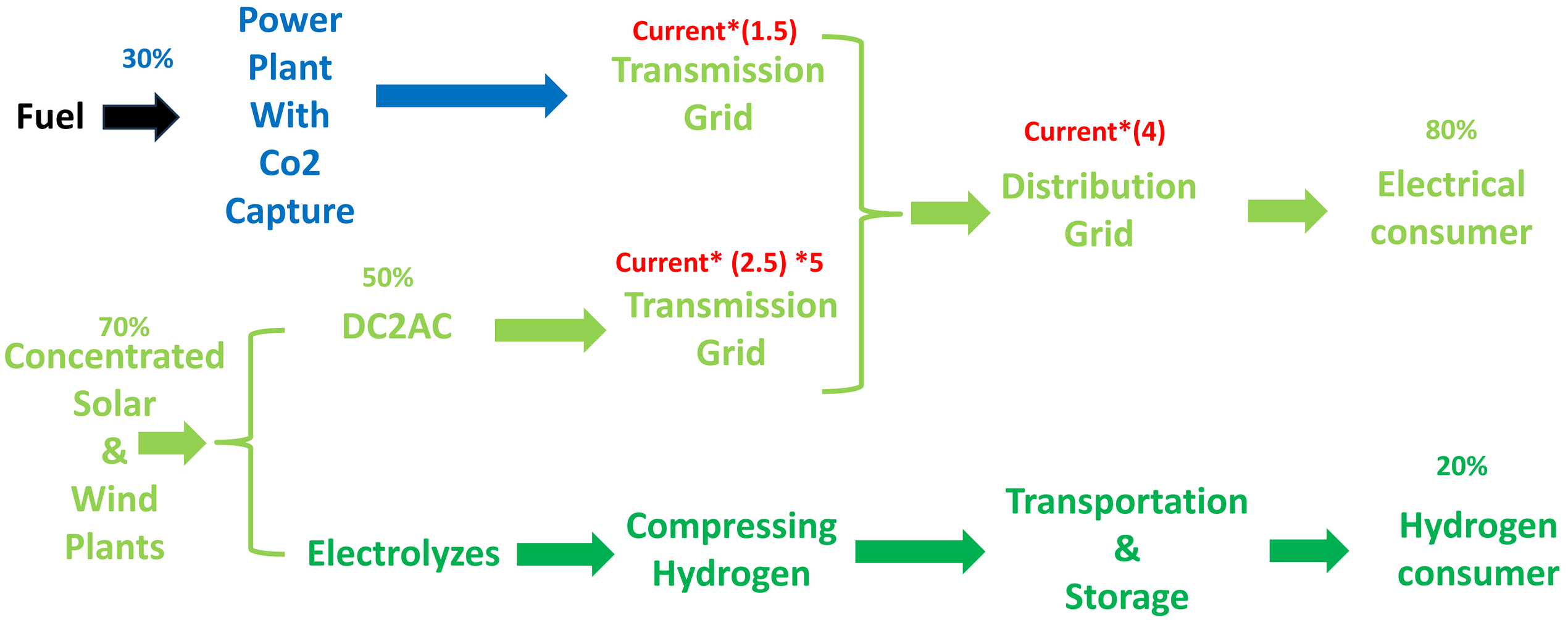
(η-98%)

80% Hydrogen consumer

Long term storge

Optimistic Efficiency Calculation

COMPETING MODELS - COMMON SCENARIO



THE HIDDEN INFRASTRUCTURE COSTS OF “ELECTRIFICATION” IN TRADITIONAL METHODS

Distribution AC Power Grid

4XGrid

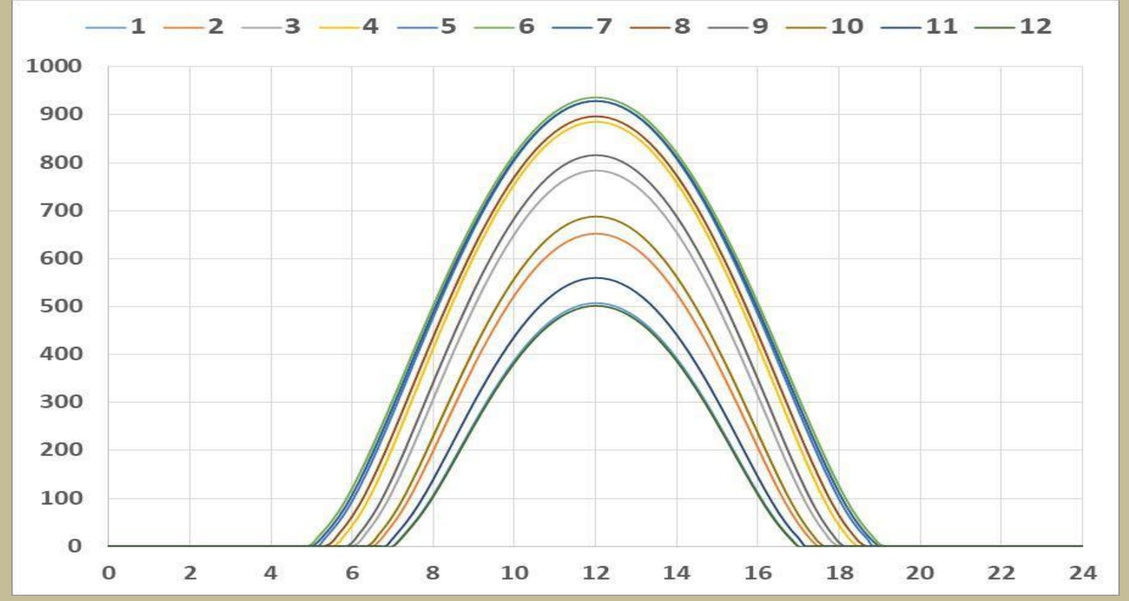
Massive Short-Term Storage

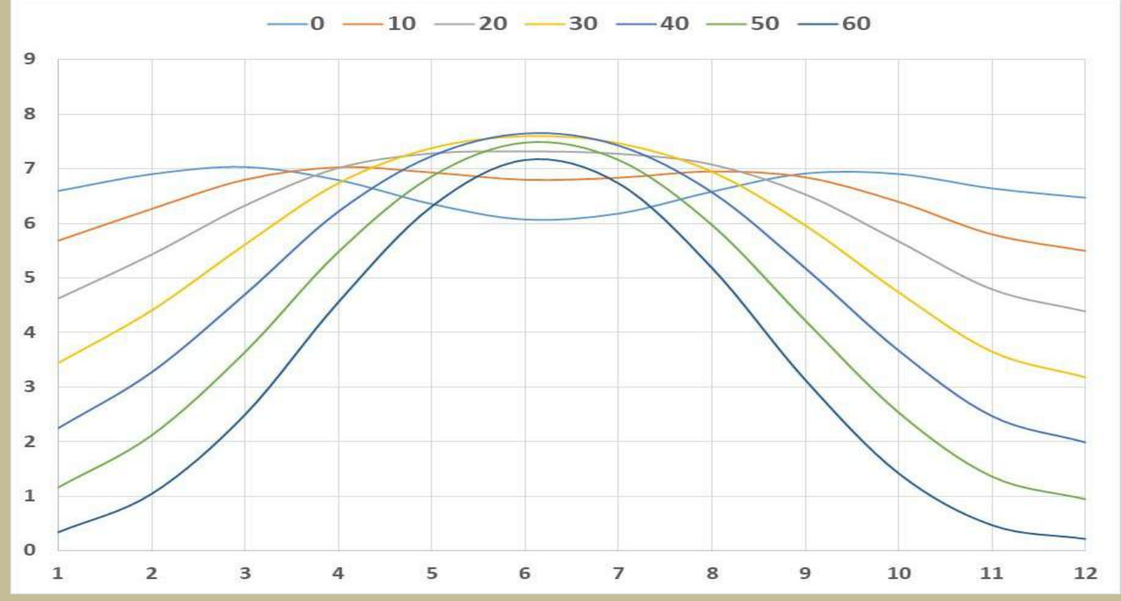
+ 150$/kWh + installation costs

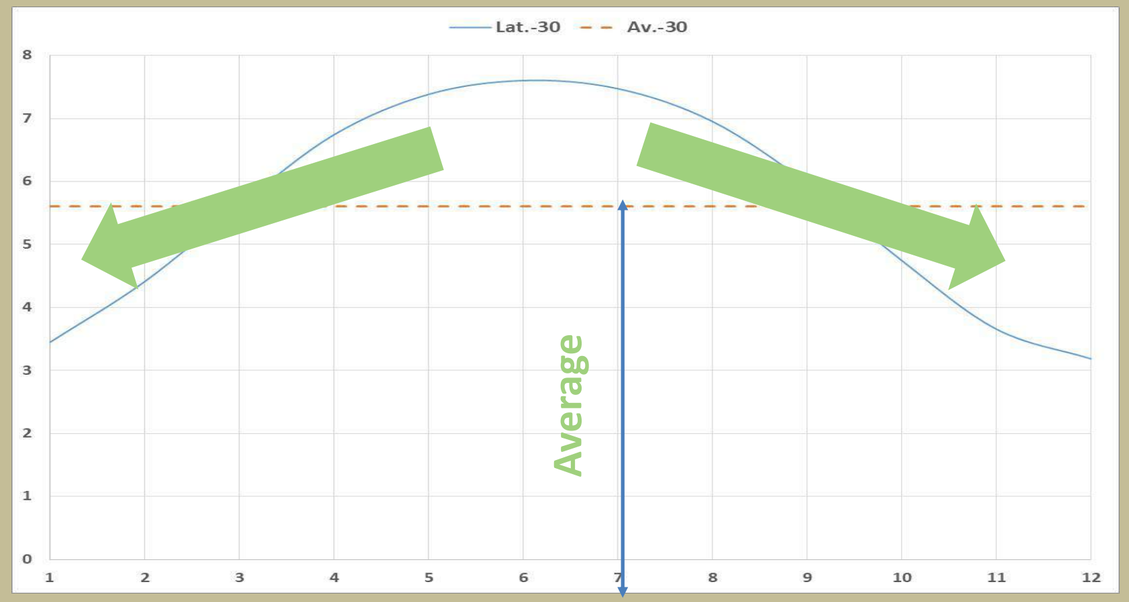
Long Distance AC Transmission

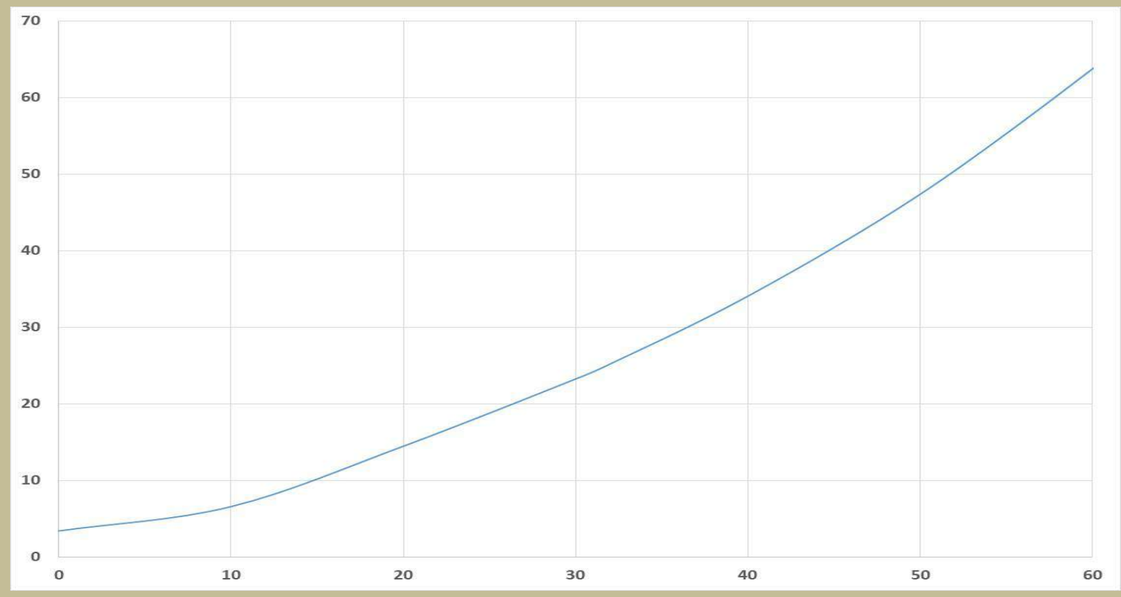
Import-Export Economy

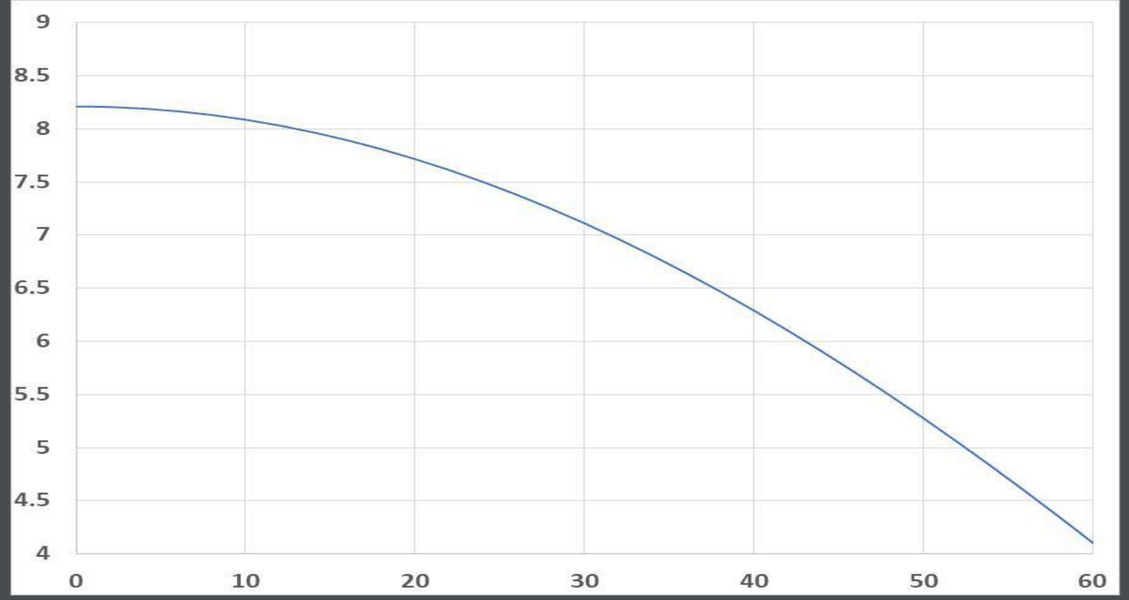
+ HYDROGEN INFRASTRUCTURE

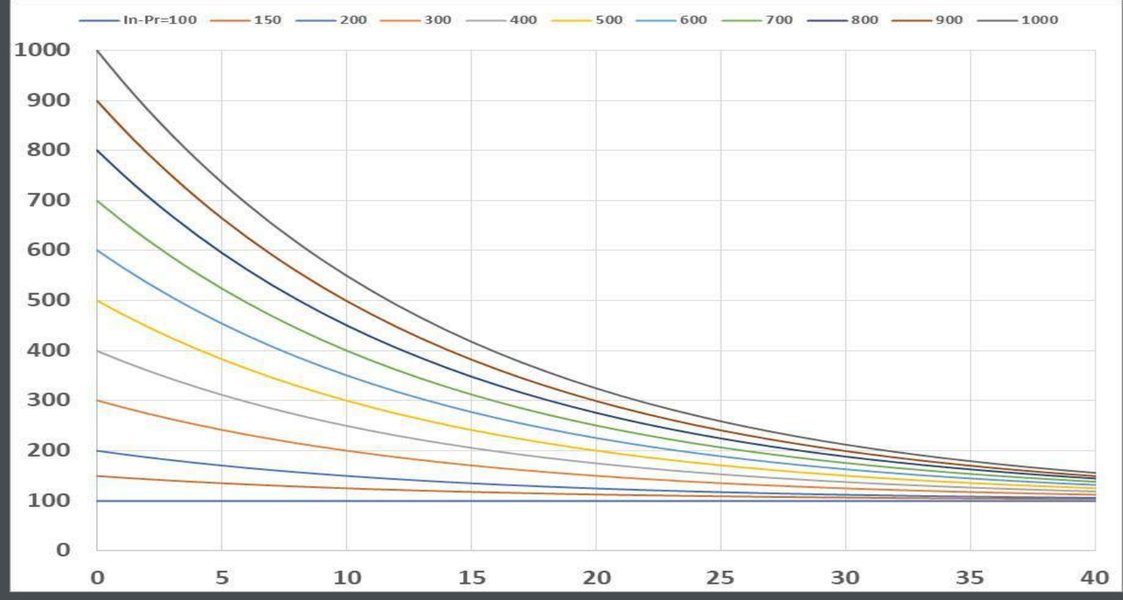

1
2
3
4
5
6
7
8
9
10
11
12
1000
900
800
700
600
500
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Global radiation, W/m²
Daytime, h

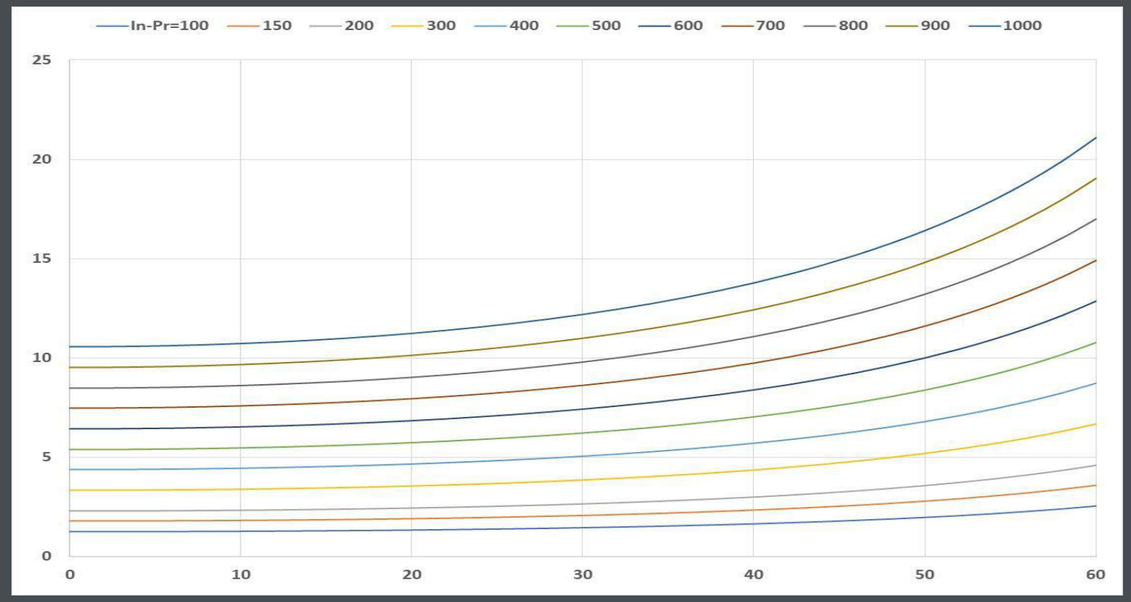

0
10
20
30
40
50
60
9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
Global radiation, kWh/m² d
Date, month

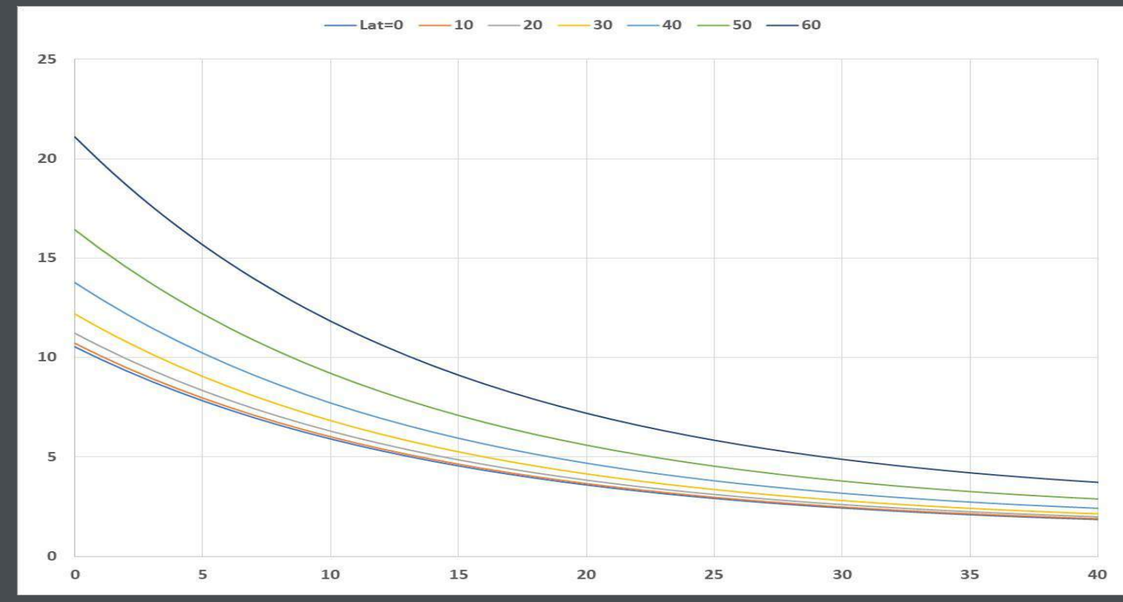

Lat.-30
Av.-30
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9
10
11
12
Average
Global radiation, kWh/m² d
Date, month


70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
Required energy storage, d
Latitude, Deg.

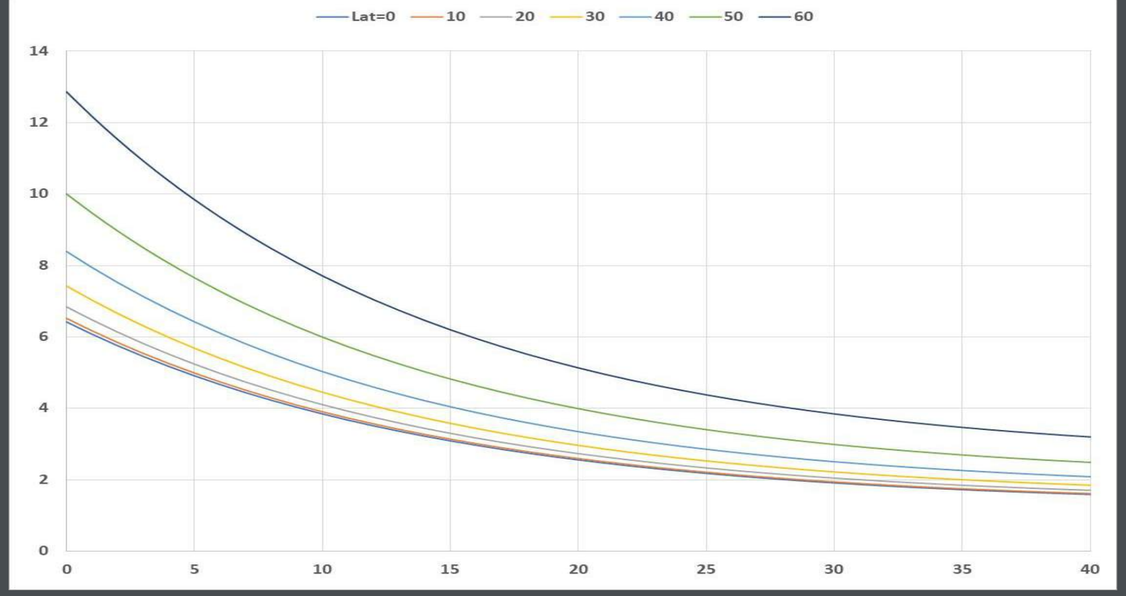

Hydrogen production, kg/m² y
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
0
10
20
30
40
50
60
Latitude, Deg.


HydRoad cost, $/m²
In-Pr=100
150
200
300
400
500
600
700
800
900
1000
1000
900
800
700
600
500
400
300
200
100
0
0
5
10
15
20
25
30
35
40
Time, years

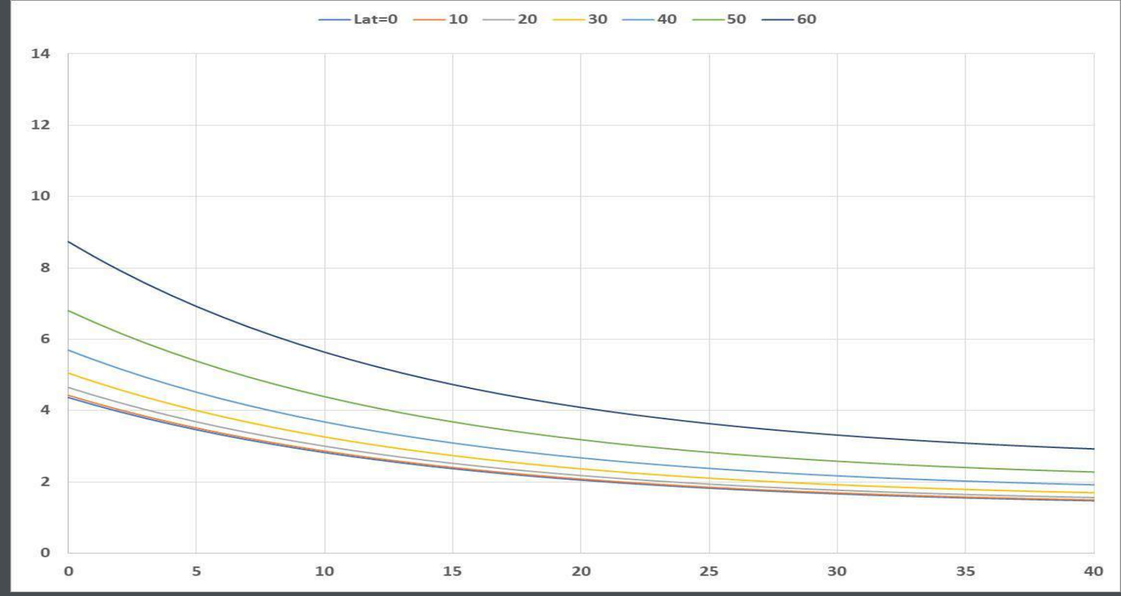

LCOE, $/kg(H2)
In-Pr=100
150
200
300
400
500
600
700
800
900
1000
25
20
15
10
5
0
0
10
20
30
40
50
60
Latitude, Deg.


LCOE, $/kg(H2)
Lat=0
10
20
30
40
50
60
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
Time, years

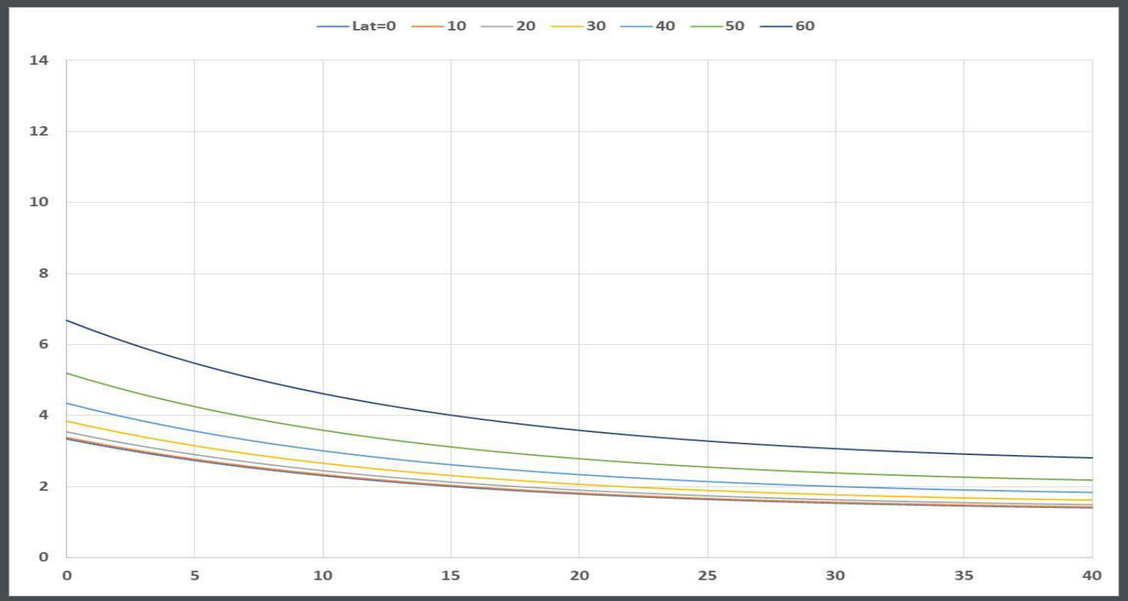
1000 $/m²



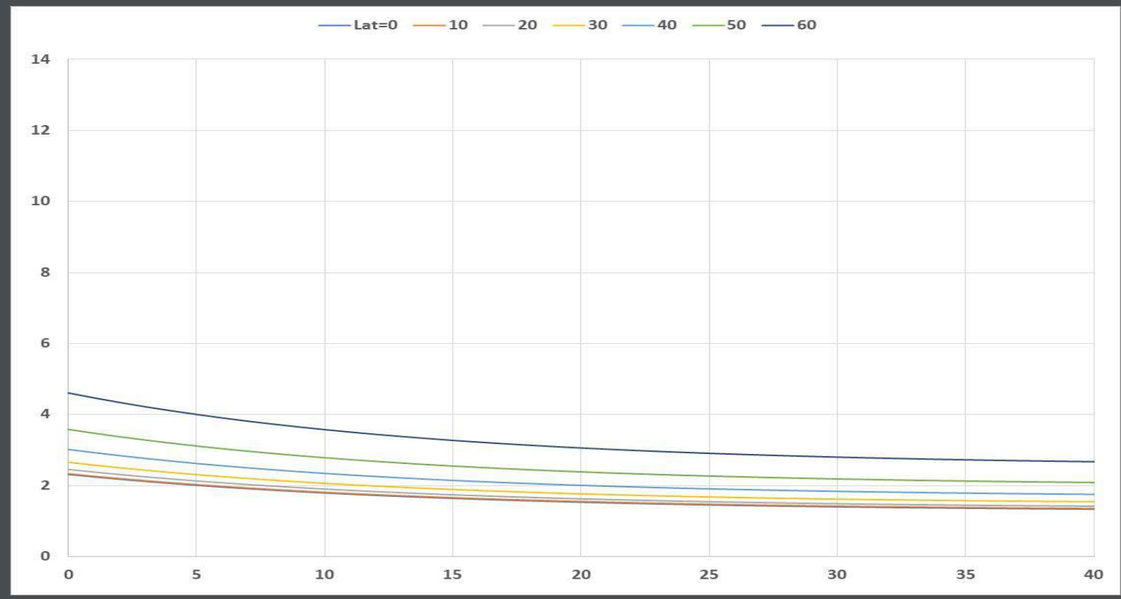
600 $/m²



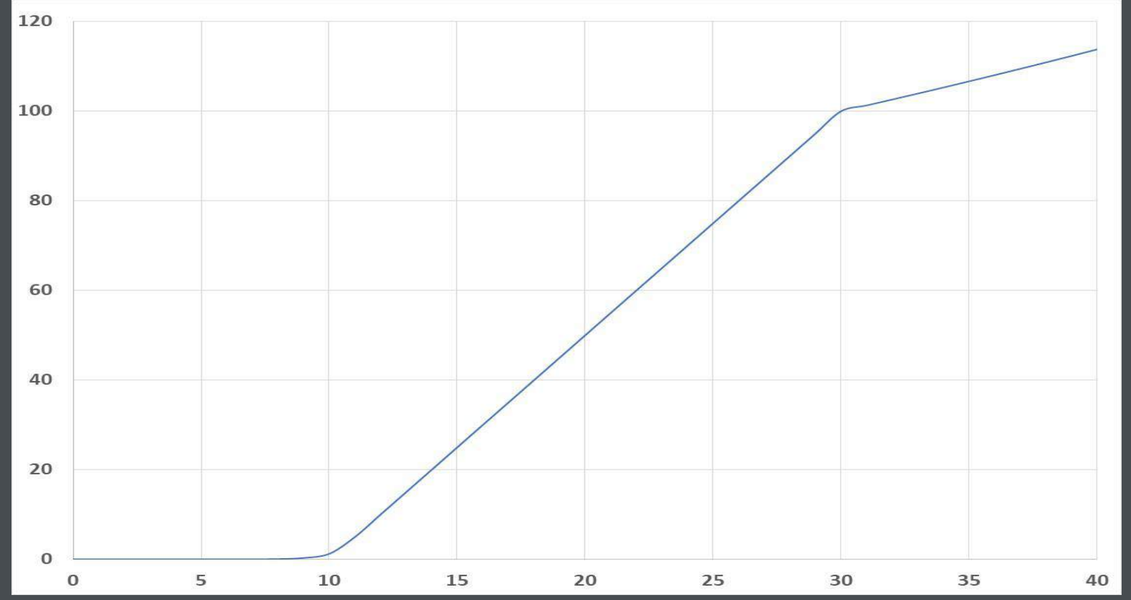
400 $/m²

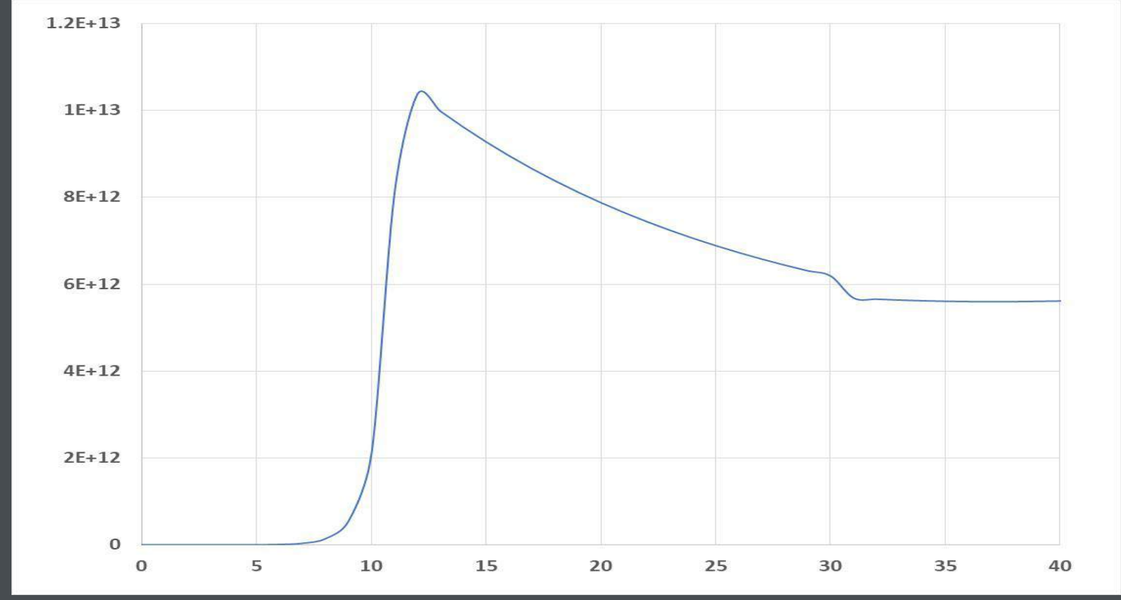


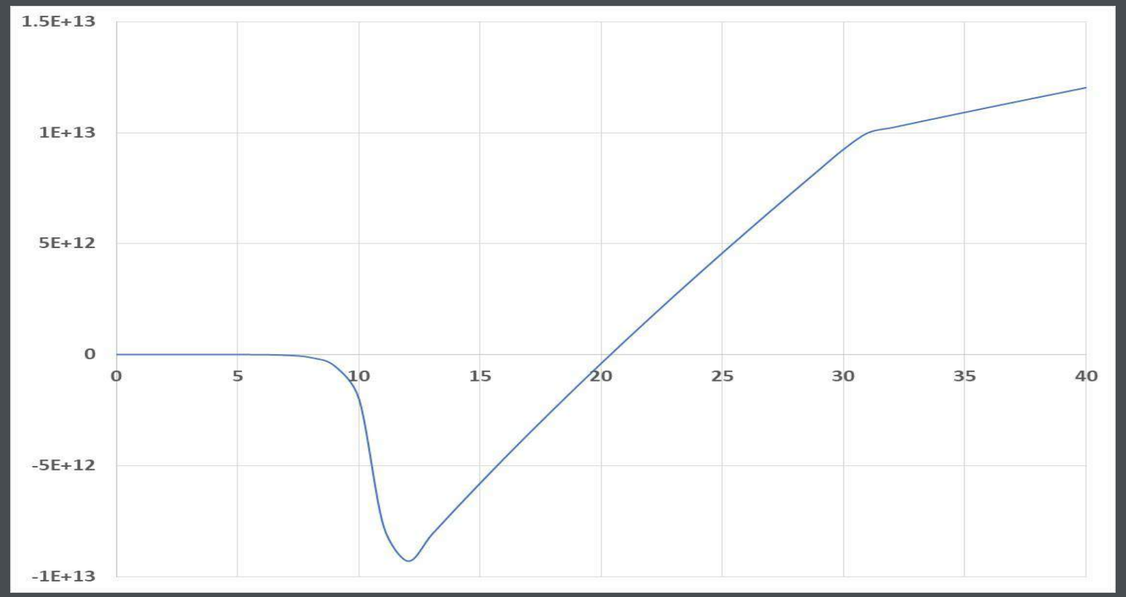
300 $/m²

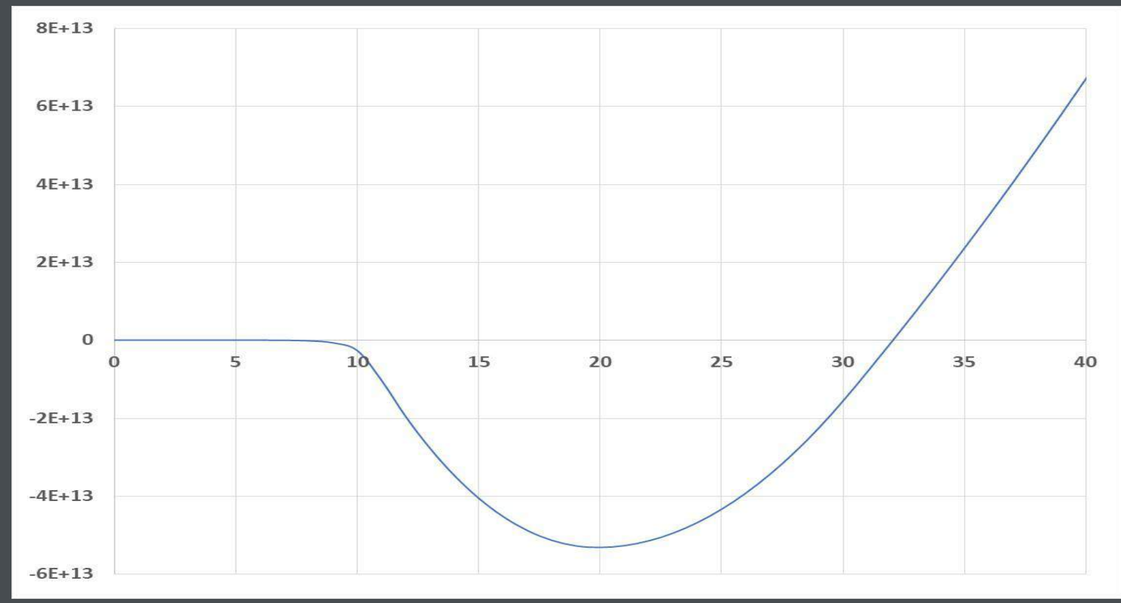


200 $/m²


Installation part, %
120
100
80
60
40
20
0
0
5
10
15
20
25
30
35
40
Installation date, year


Installation cost, $/y
1.2E+13
1E+13
8E+12
6E+12
4E+12
2E+12
0
0
5
10
15
20
25
30
35
40
600 $/m²
Installation date, year

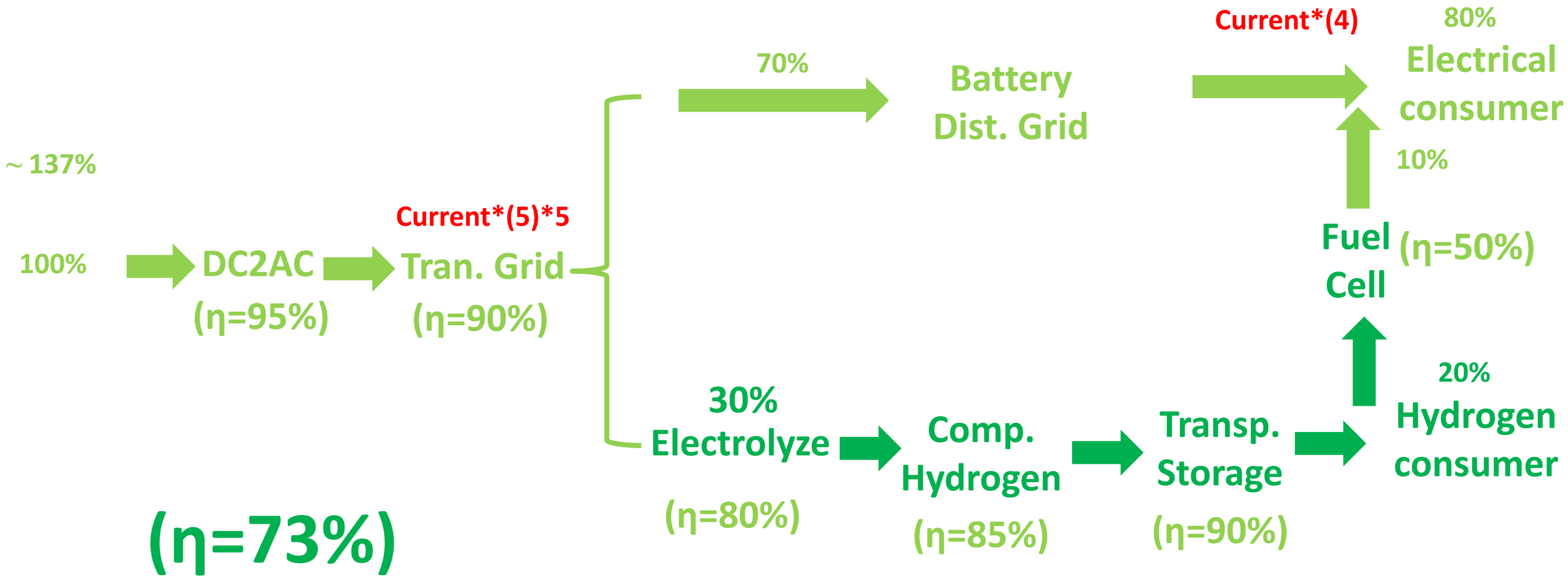

Operating profit, $/y
1.5E+13
1E+13
5E+12
0
-5E+12
-1E+13
0
5
10
15
20
25
30
35
40
4 $/kg
Installation date, year


Cumulative operating profit, $
8E+13
6E+13
4E+13
2E+13
0
-2E+13
-4E+13
-6E+13
0
5
10
15
20
25
30
35
40
Installation date, year

Fuel = ~ 126%

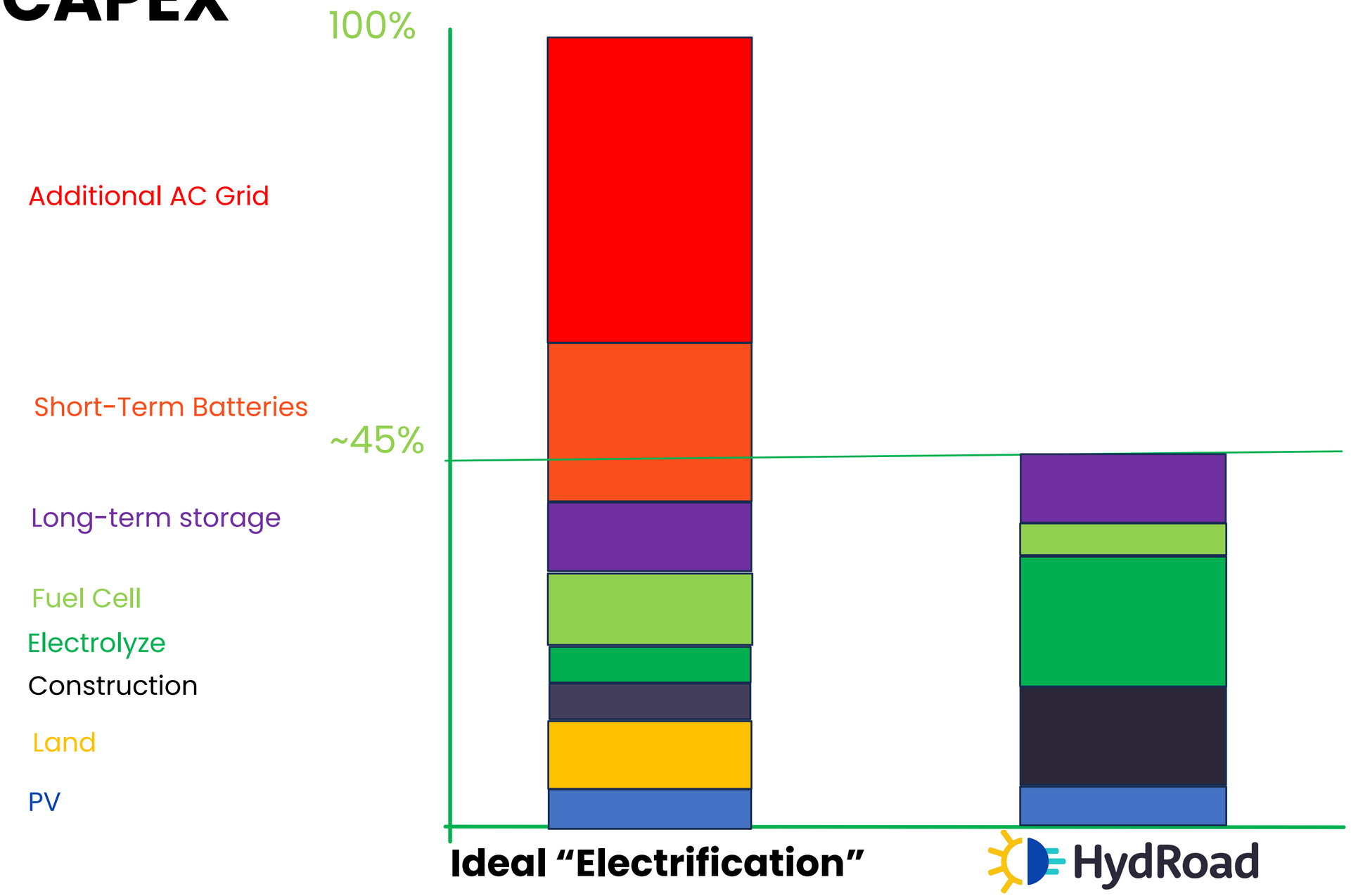
Eq. = ~ 109%

IDEAL “ELECTRIFICATION” SCENARIO



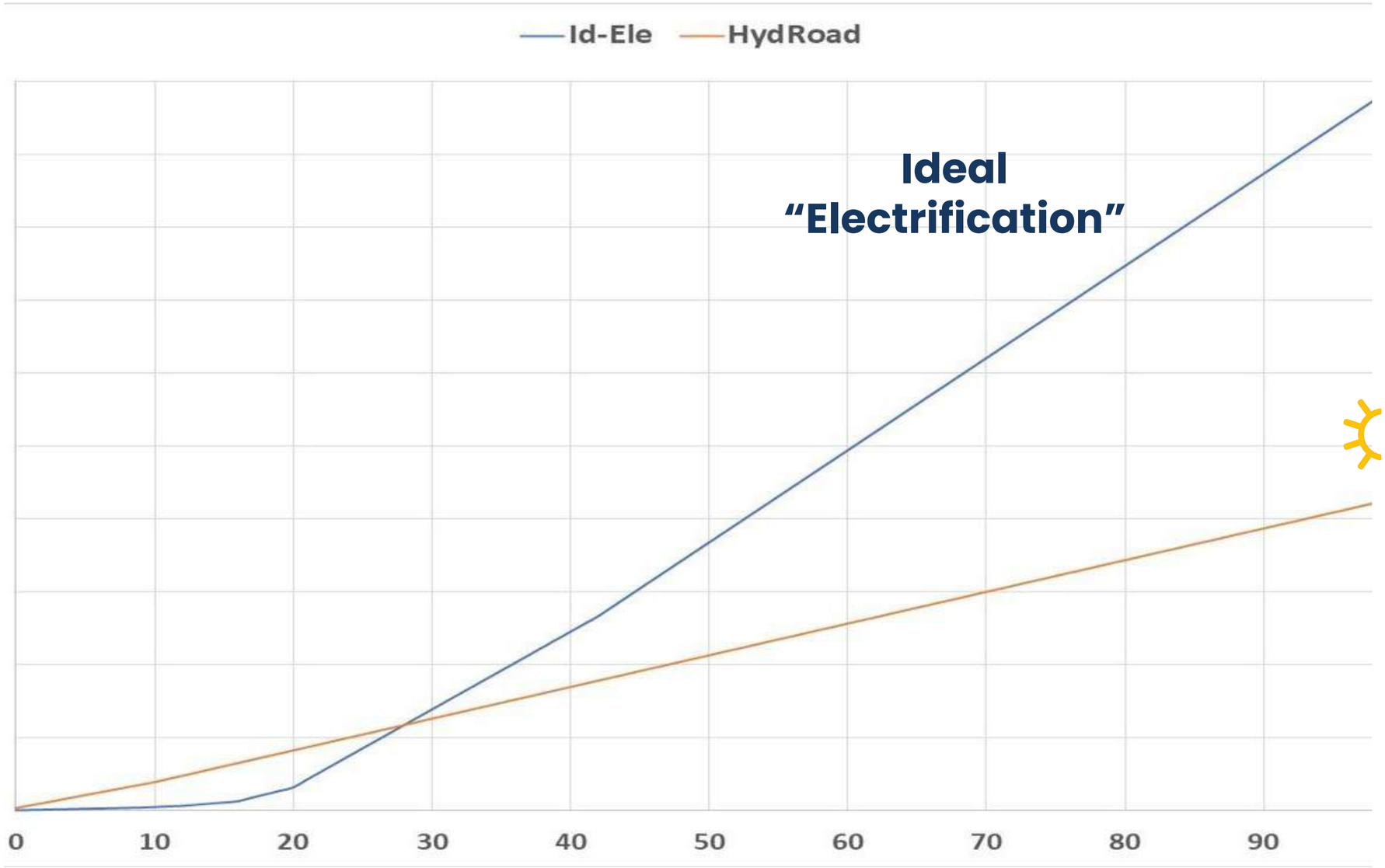
(η=73%)

CAPEX


100%
~45%
Additional AC Grid
Short-Term Batteries
Long-term storage
Fuel Cell
Electrolyze
Construction
Land
PV
Ideal “Electrification”
HydRoad

QUALITATIVE COMPARISON

CAPEX Cost (%)



HydRoad

Sustainable implementation (%)

Fuel = ~126%

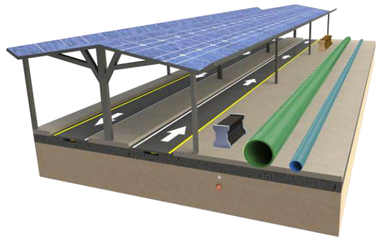
Eq. = ~93%

HydRoad + "ELECTRIFICATION"

~117%

100%

Distributed Solar Road PV



28%

(η=100%)

DC Distribution Micro-Grid

80% Electrical consumer

42%

Battery (η=90%)

10%

Fuel cell (η=50%)

30%

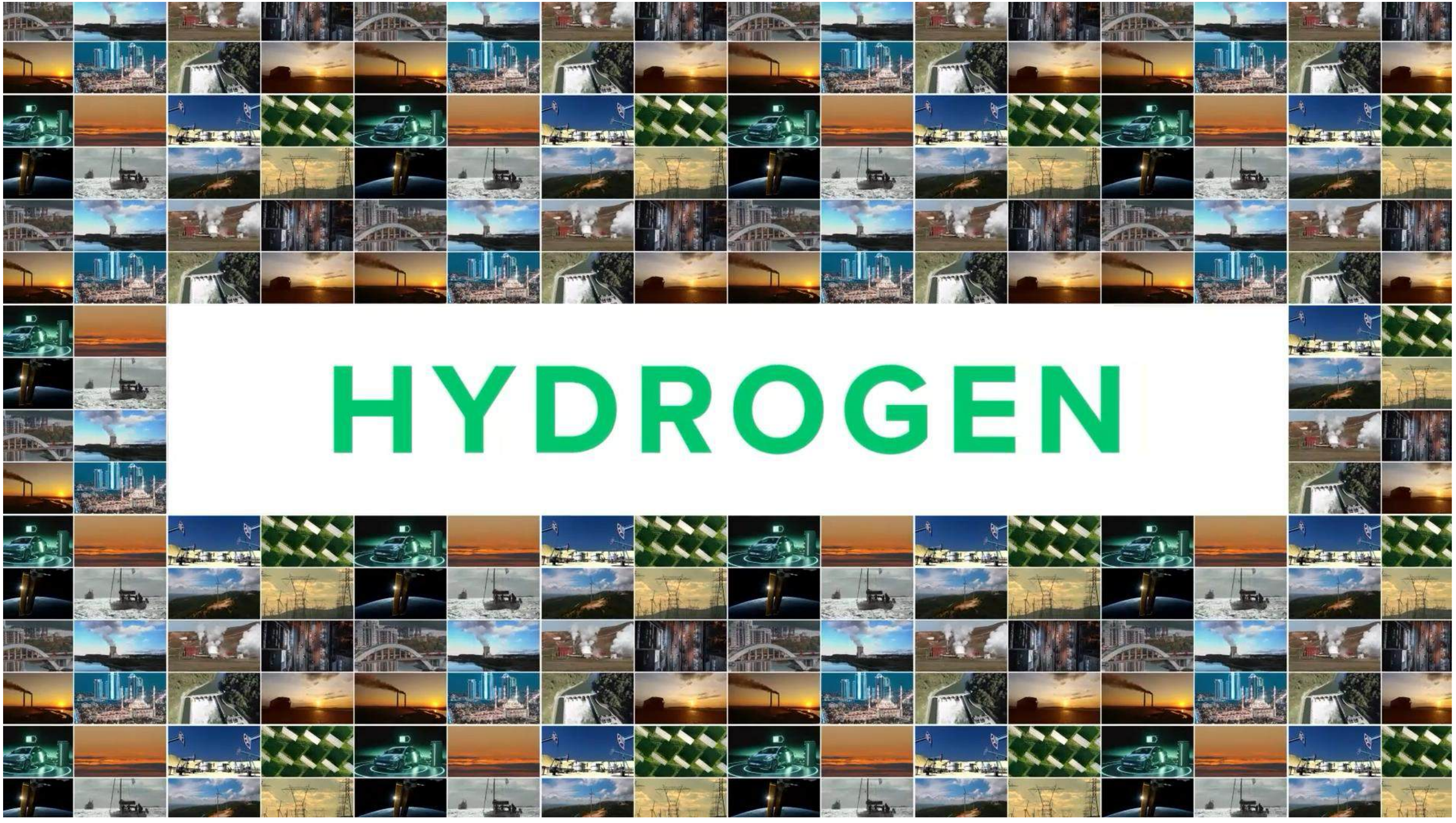
Electrolyzes (η=80%)

Low pressure, Sink & Source Hydrogen Pipes system (η-98%)

20% Hydrogen consumer

Long term storge

(η=85%)


HYDROGEN

THANK YOU!

hydroad.net
info@hydroad.net