WELCOME!
TECHNIP / AICHE

PLANT ONE ROTTERDAM B.V.

OCTOBER 12TH , 2021

Safety @ Plant One Rotterdam

When there is an alarm on site 5210:

- Stop what you're doing
- Follow the instructions given by the Emergency Response Officer or your POR tour guide
- Evacuation from building: nosecount at assembly area
- In case of gas alarm: safe area in Invista office building

Safety @ Plant One Rotterdam

Safety in the plant:

- Bump cap
- Safety glasses
- Stay on indicated footpath (yellow lines)
- No smoking
- No eating or drinking
- No cell phones

Safety @ Plant One Rotterdam

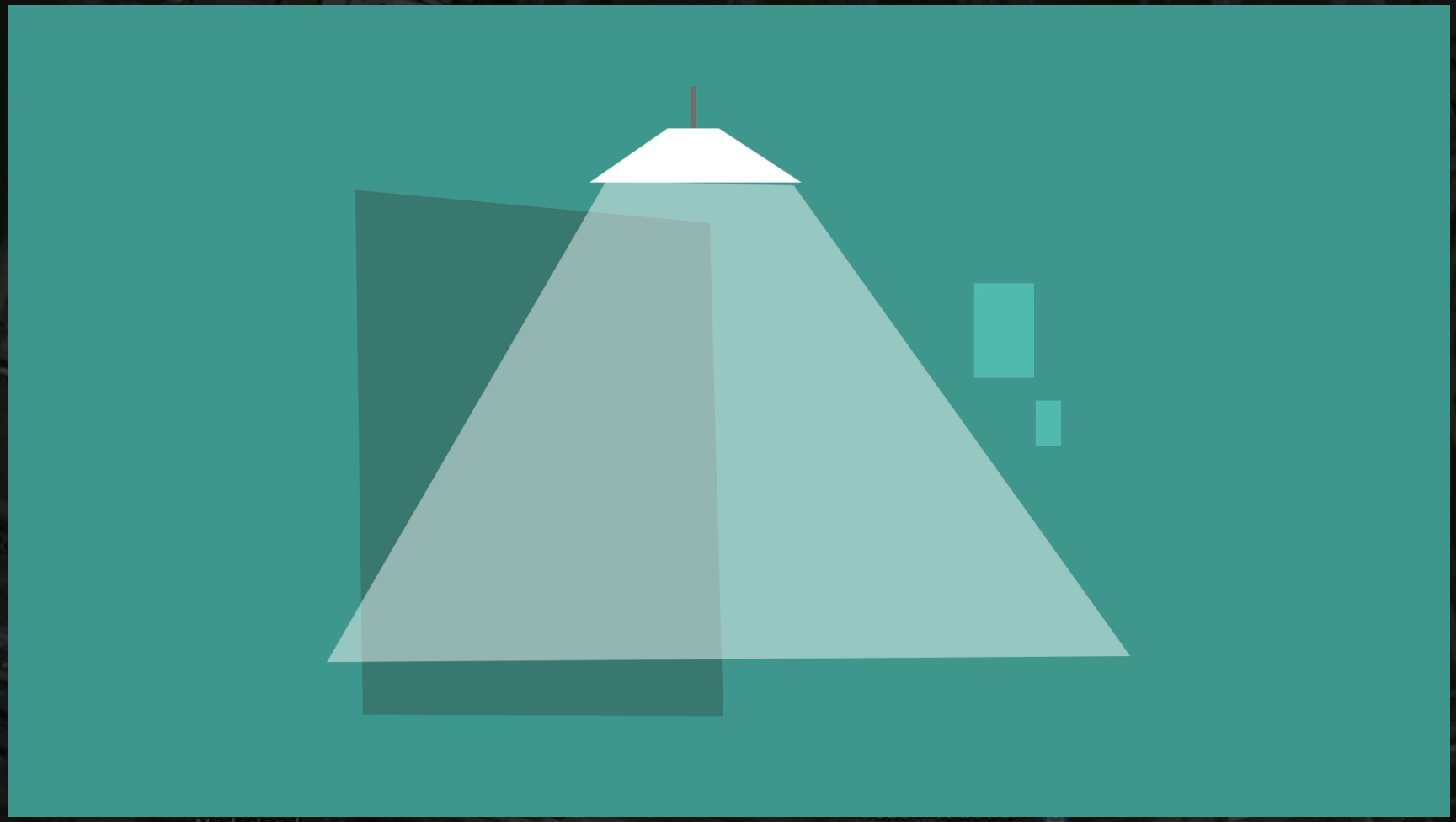
Corona:

- Respect normal hygiene measures
- Maintain safe distance (1,5 meters)
- Face mask (optional, not mandatory)

Agenda

- 15.00 hrs: welcome and safety briefing
- 15.05 hrs: introduction Technip and POR
- 15.45 hrs: plant tour POR and visit to Technip burner pilot installation
- 16.45 hrs: Q&A and closing remarks
- 17.00 hrs: adjourn

Plant One Rotterdam: who are we?



What do we do?

The business activities of Plant One Rotterdam B.V. consist of realizing and operating a location where companies and research institutions can test and demonstrate their innovative ideas for sustainable technologies on a (semi-)commercial scale, with all related activities.

Our license to operate: continuous focus on safety of our residents and potential impact on our surroundings Ensure the safety of our site residents and surroundings

Our offering

Full range service package

- Unique environmental permit: projects approved within 8 weeks
- Space: 25.000 m^2 pilot/demo plant space
- Utilities: electricity, steam, nitrogen, compressed air, natural gas, drinking, demi, process and cooling water
- Expertise and resources: design, engineering, construction, operations, maintenance, lab facilities

Strong network

- Schools and universities
- Industry networks
- (Semi-)government

One Stop Shop

What drives us?

- Ambition to make the Paris climate agreement achievable.....
  ..... but in a very pragmatic way!
- No time to waste: developing work solutions to today's problems
- Learn by doing
- Customer focus: tailor-made solutions

It is all about acceleration !!

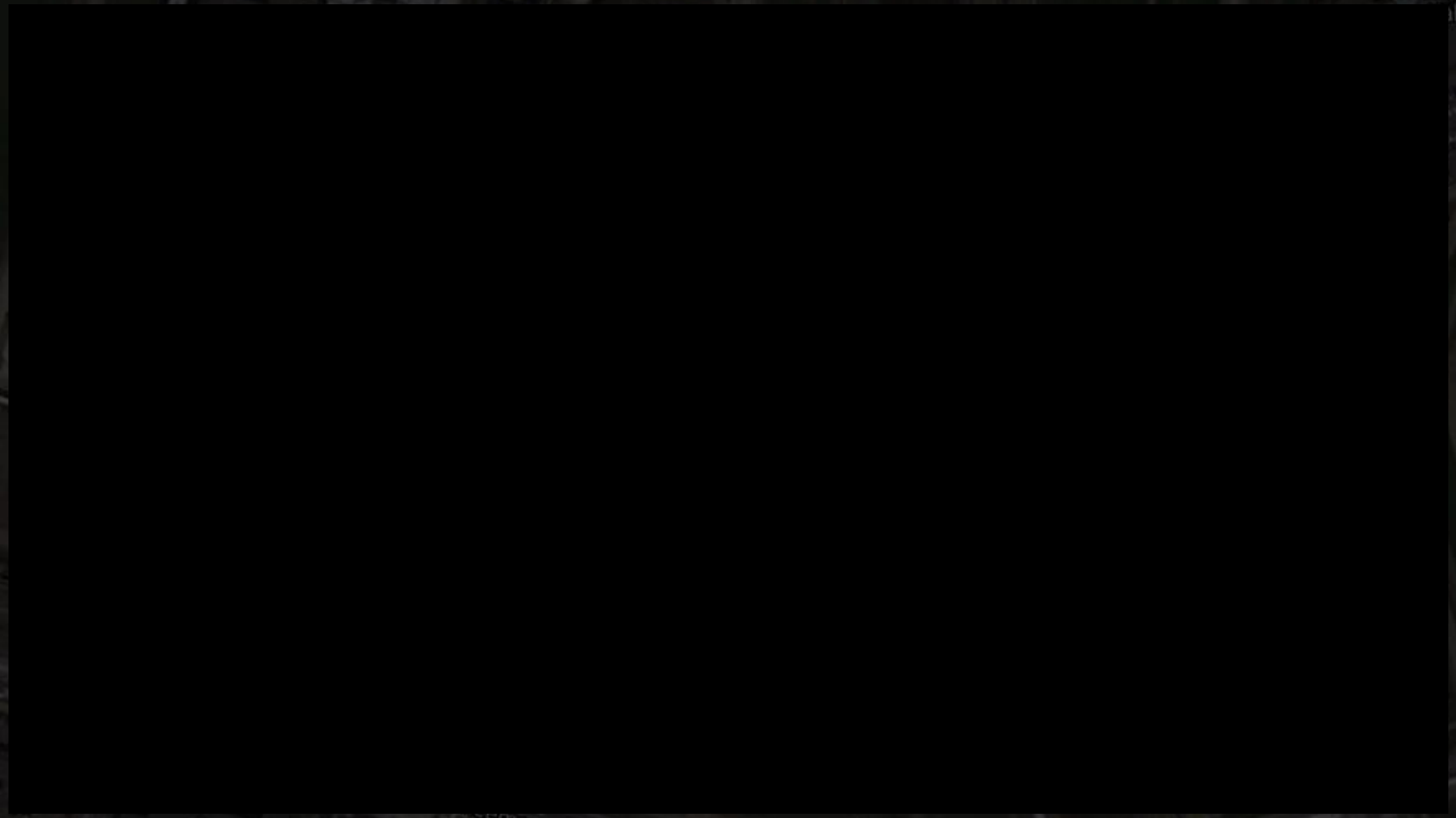
Some examples

- **PyroOne**: highly integrated pyrolysis process to convert waste materials into valuable products that can be used as replacement for fossil-based products
- **Ioniqa**: closing the loop on PET. A depolymerization process that turns residual PET into high quality virgin material
- **H_2CiF:** a circular process for storage and generation of hydrogen

PYRO ONE BV

10-08-2021

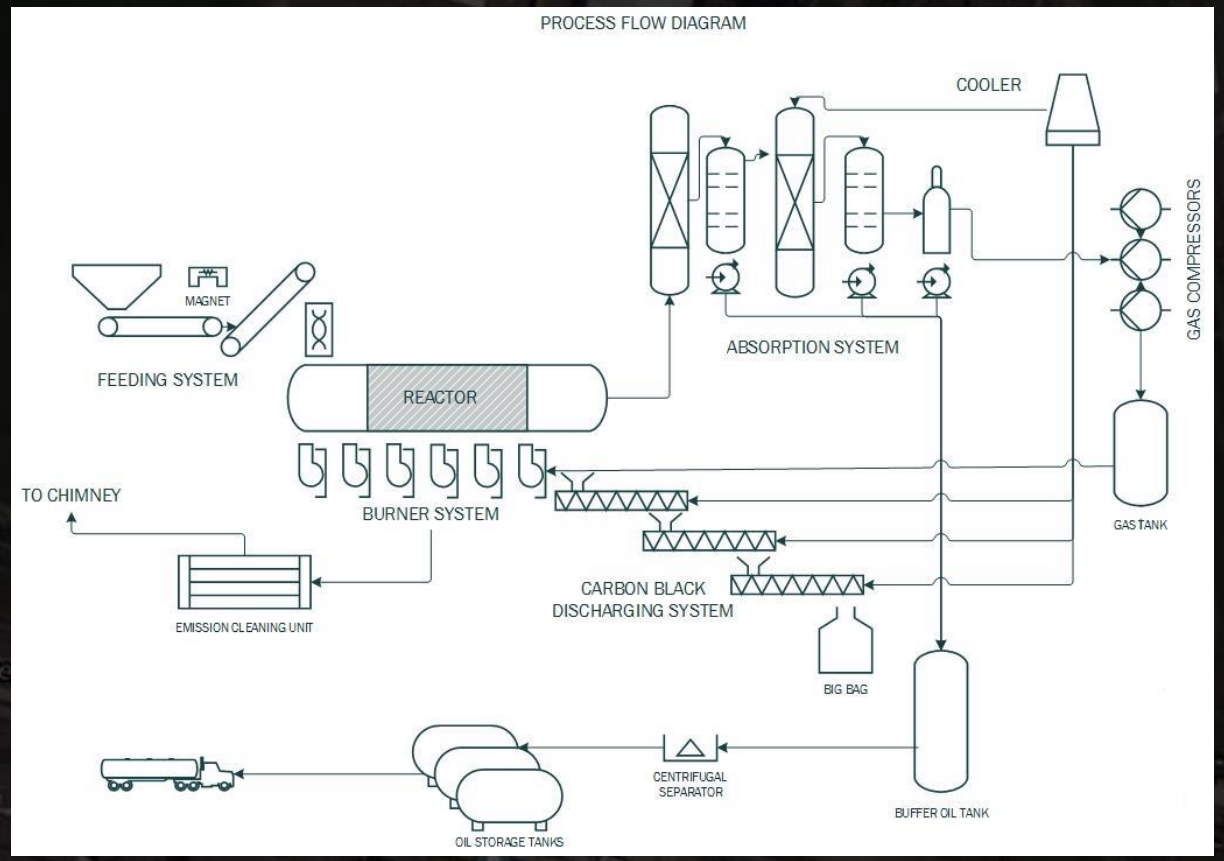
Pyro One



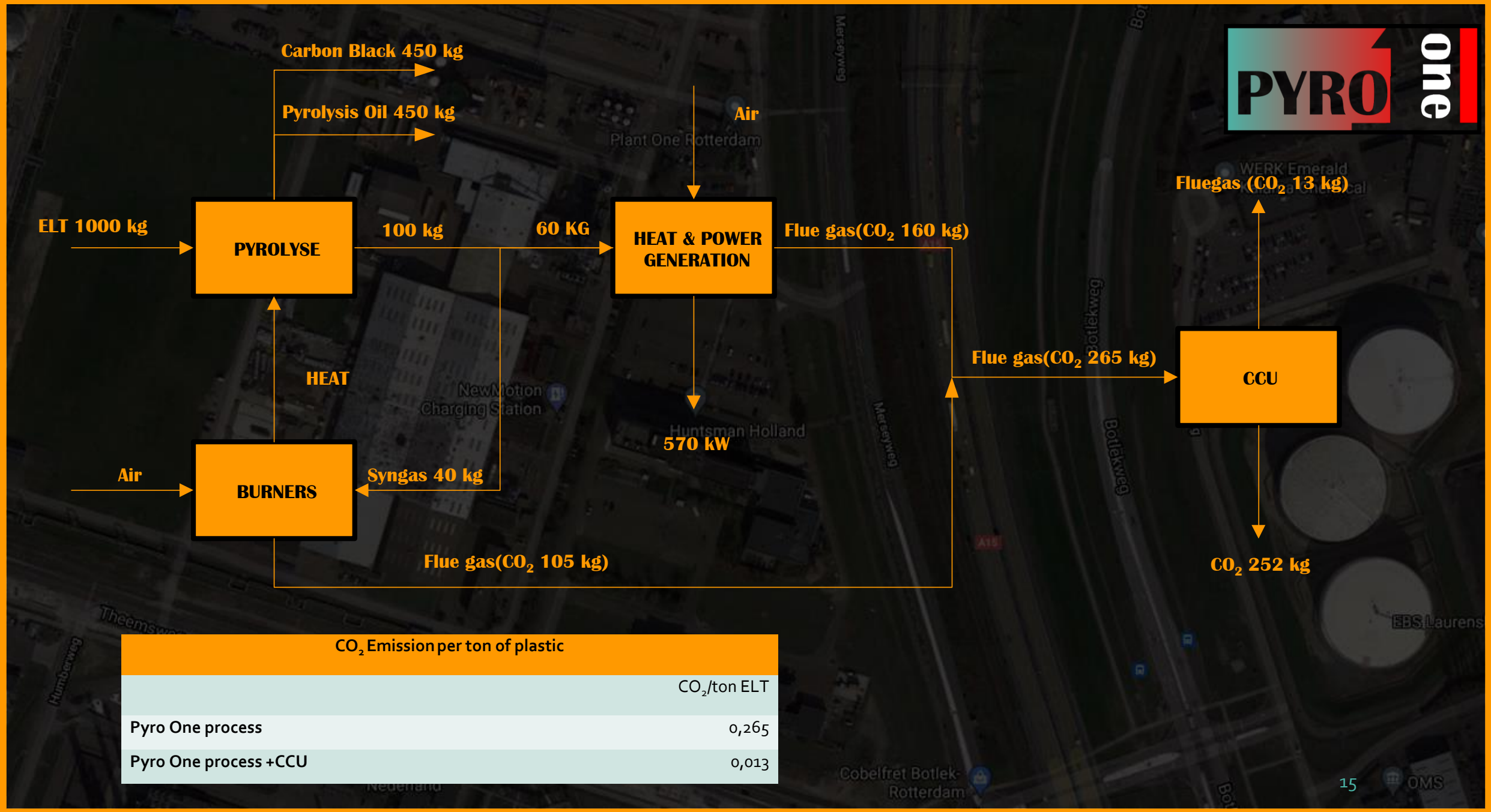
Proces description

- The technology for reprocessing of End-of-Life Plastics is based on the process vacuum pyrolysis at high temperature and lack of oxygen. Under these conditions thermally dissociation on the plastic is made. The current technology is with continuously process 24 hours x 7 days fully automated by Emerson Delta V system.
- **Stages of the process – Pyrolysis Unit:**
  - - Feeding of the pyrolysis reactor;
  - - Vacuum pyrolysis of the material;
  - - Exit of the pyrolysis gases;
  - - Condensation of the pyrolysis gases and separating of liquid fraction;
  - - Separation of wastewater and sludge from the oil;
  - - Exit of the carbon black and cooling;
  - - Electricity generation from surplus gas;

PFD & Capacity



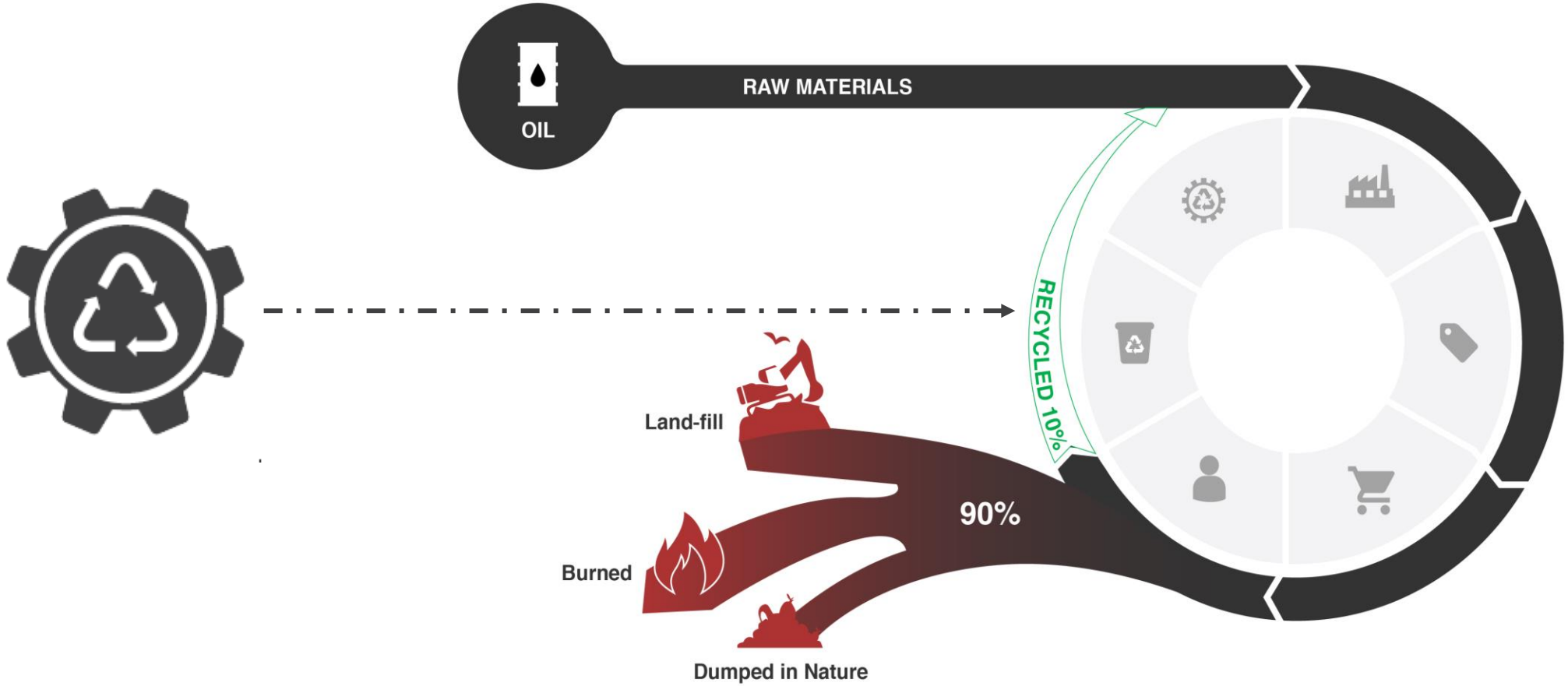
Plant Capacity			
	Stream	Hourly Capacity (kg)	Yearly capacity (Ton)
1	ELT input	1.000	6.500
2	Oil Output	450	2.925
3	Carbon Output	450	2.925
4	Gas output	100	650



CO_2 Emission per ton of plastic	
	CO_2/ton ELT
Pyro One process	0,265
Pyro One process +CCU	0,013

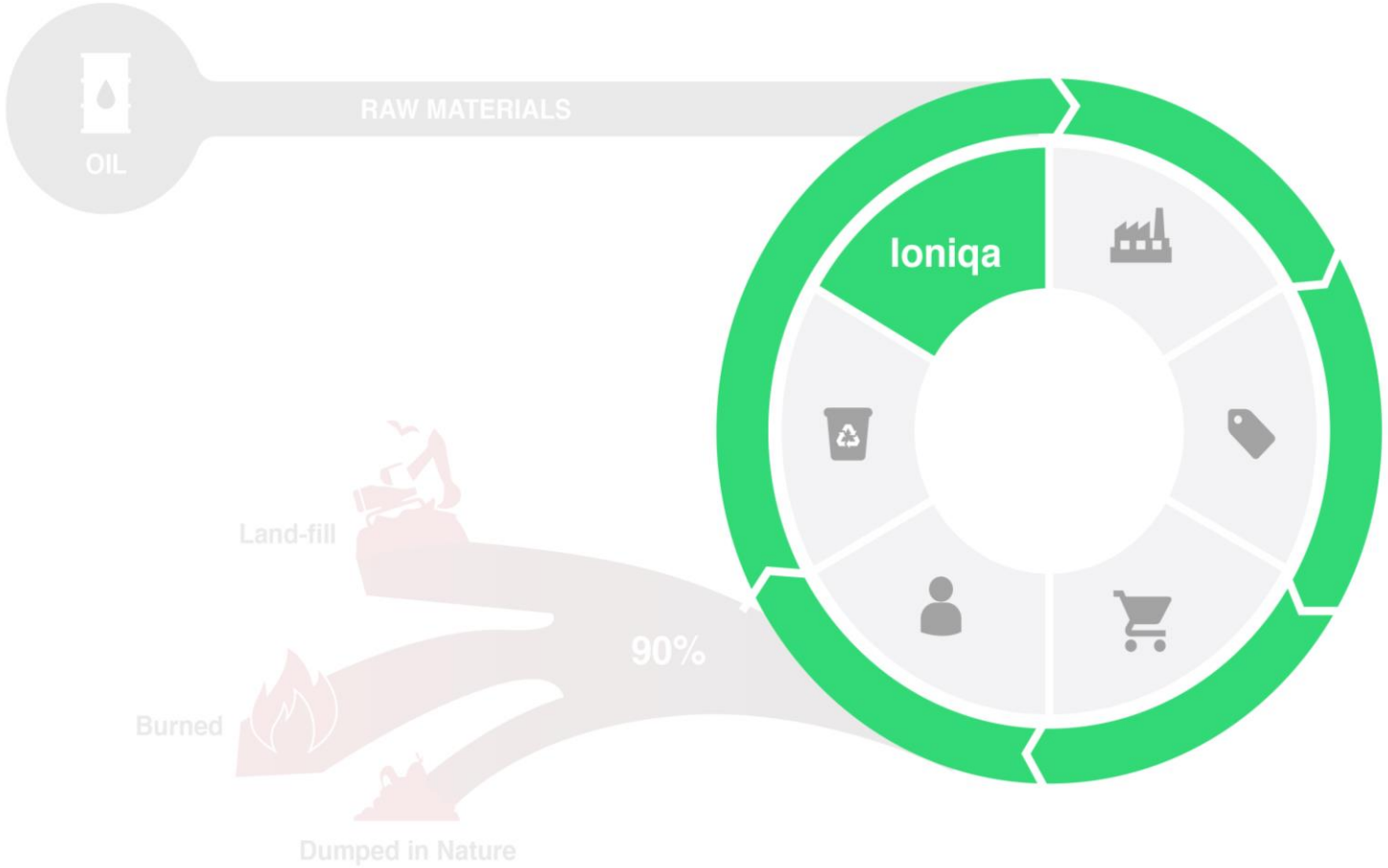

ioniqa

Present Day: a Linear Economy



ioniqa

Ioniqa presents: a Circular Solution



Cradle to Cradle

ioniqa

Benefits from Ioniqa's Technology

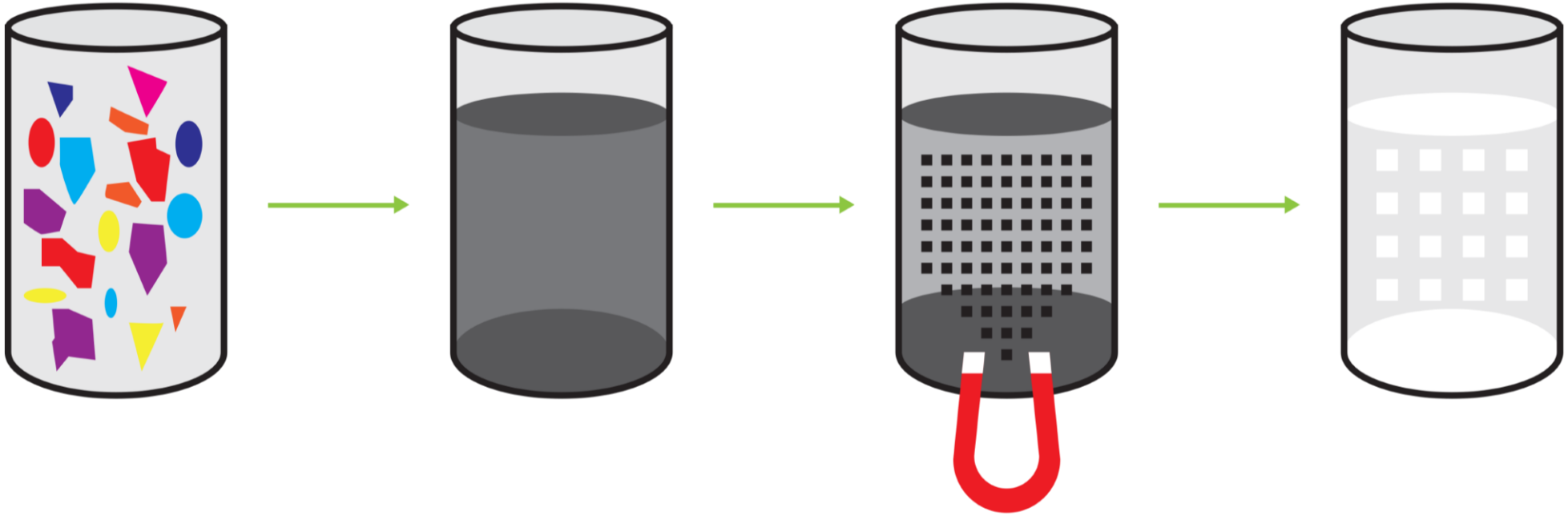
Cost and quality competitive to oil-based PET

Matches with existing PET polymerization plants

Non-toxic consumables and solvents will be recycled → 75 % less CO_2 emission

ioniqa

Ioniqa's Game Changing Technology



STEP 1
SHREDDED COLORED PET WASTE

STEP 2
DEPOLYMERISATION REACTION

STEP 3
MAGNETIC SEPARATION

STEP 4
HIGH QUALITY RAW MATERIALS

ioniqa

H_2 Circular Fuel B.V.

by Hans te Siepe

Hydrogen in salt as reusable energy, safe mass storage and high efficiency recycling.

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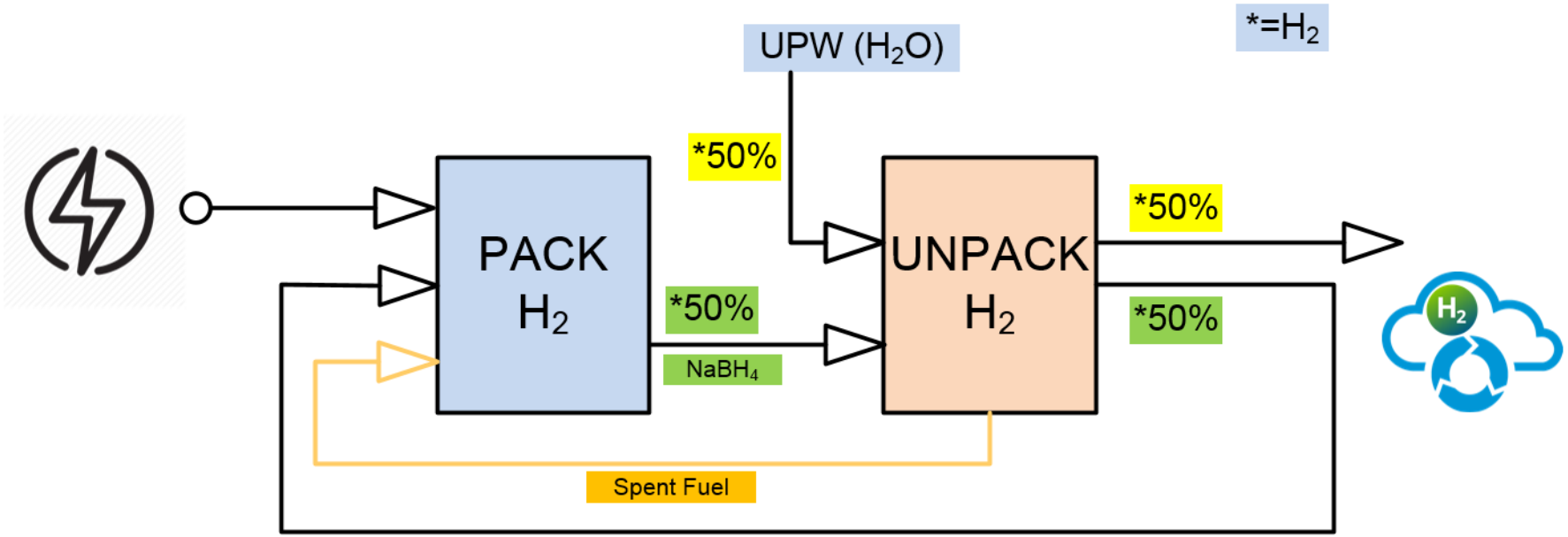
CIRCULAR H2 Key Technology



- $NaBH_4 + 2H_2O$ ——-> $NaBO_2 + 8H$ + 90*C warmte

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CIRCULAR H2 Key Technology

1. Energy density is comparable with diesel.
2. Energy efficiency from well to wheel
    - Diesel average 6%
    - H2Fuel >15%
3. H2Fuel full cycle has been proven by Universities of Delft and Amsterdam.
4. The catalyst activator has been developed by University of Gent (Belgium)
5. The full cycle is emission less, so Carbon dioxide → ZERO
6. Future sustainable

Plant tour POR

‘Walk-by’ of innovation projects at Plant One Rotterdam:

- Chemical recycling: pyrolysis and gasification
- Chemical recycling: depolymerization
- Chemical recycling: metal recovery
- Hydrogen storage and production
- Burner technology (-> Technip)