

Hydrogen Production & Storage under favorable atmospheric conditions for Small and Smart Production of Renewable Energy

Uranus (Romain Divinity of the sky) Project
Clean Hydrogen: R&I collaboration opportunities between Canada, Switzerland & Wallonia
Eureka/ Eurostars

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Haute Ecole Spécialisée
de Suisse occidentale
Fachhochschule Westschweiz
University of Applied Sciences and Arts
Western Switzerland


Matgenix


ATM PRO
www.atmpro.be

Who are we?

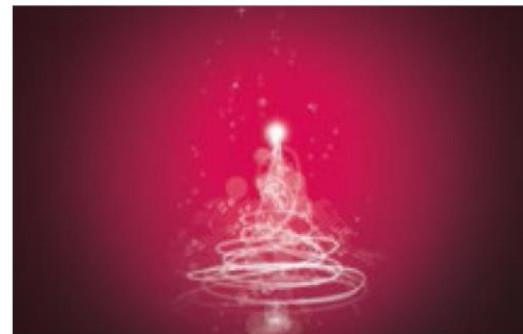


ENVIRONMENT

Air quality
Health & safety
Energy
Circular Economy

MATERIALS

(Bio-based) polymers & composites
Emissions and odours from materials
Lightweight materials
Mechanical Recycling



CHEMISTRY & INDUSTRIAL PROCESSES

Factory of the future
Intensified / Continuous processes
Micro / Meso fluidic technologies
Chemical recycling



ANALYTICAL & TECHNOLOGICAL SERVICES

Extended characterization platform / reverse engineering
Pilot equipment
Products and processes improvement



R&D partner in Chemistry

650 industrial contracts per year

Technology Readiness Level :
from 3 to 7

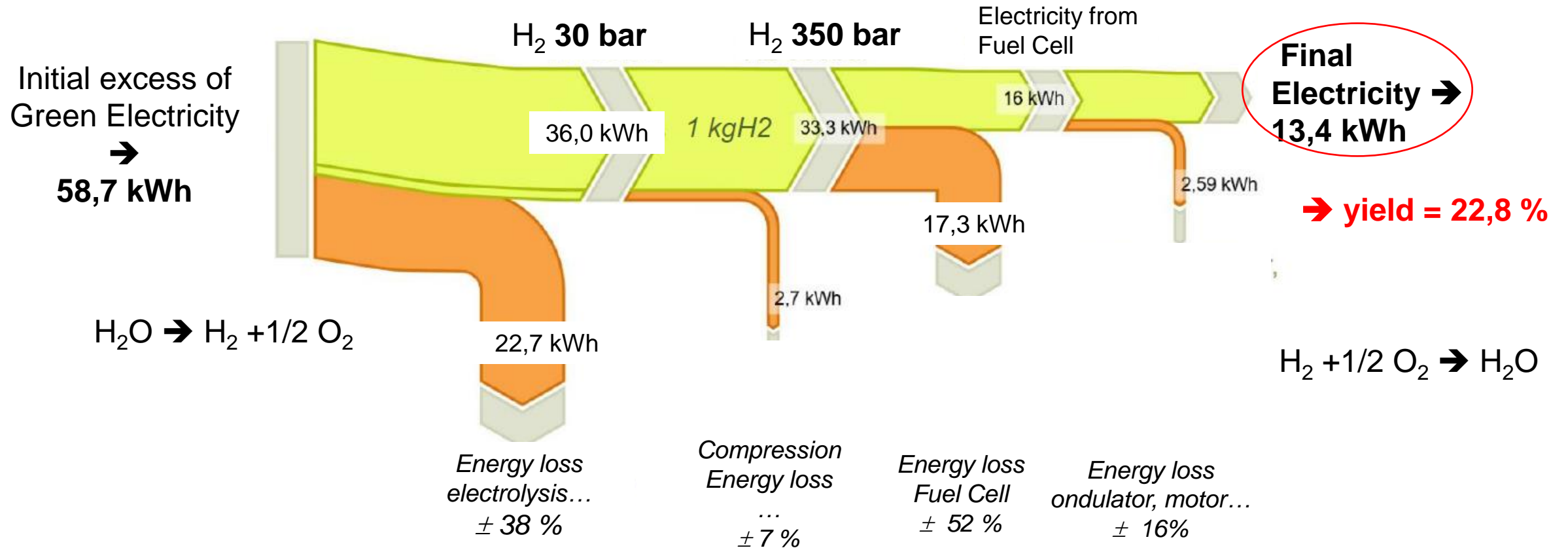
36 employees

1550+ industrial collaborations
since 2000

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Small and Smart Production of Renewable Electricity*

H₂ production & storage: present case

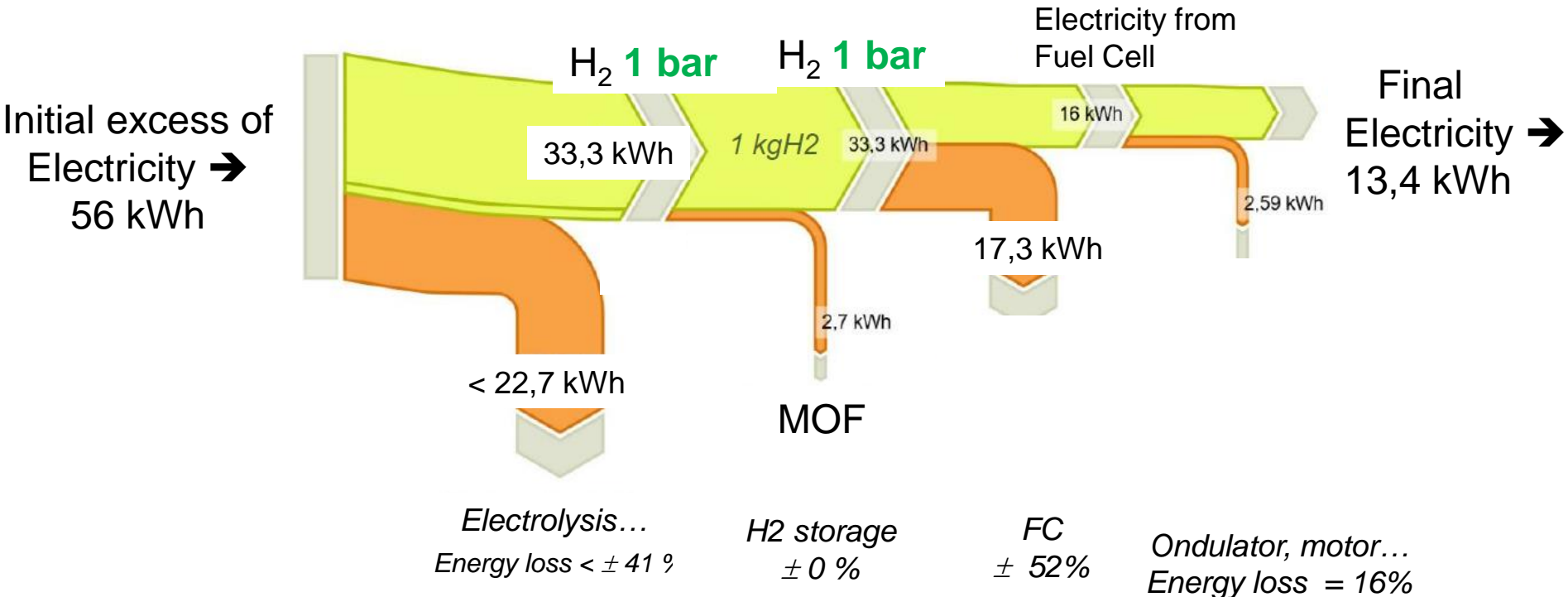
Excess of green electricity : transformation in H₂ & storage under pressure



Sankey 's Diagram : energy needed for producing 1kg H₂ and storage under pressure & resulting energy
(adapted from <https://librairie.ademe.fr/mobilite-et-transport/1685-rendement-de-la-chaine-hydrogene.html>)

H₂ production & storage: this project

Advanced Storage in MOF at moderate T°C & 1 bar



- ➔ Yield > 23,9 %
- ➔ Security
- ➔ Environmentally friendly
- ➔ Safe products
- ➔ Less important Capex



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TRL 3->5

TRL 3->5





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Partners and needs/type of partners required

Partner	Type	Role
	Certech B	RTO R&D. Synthesis & production of H ₂ Adsorbant - Optimisation for storage at RT ;
	HES-SO CH	University H ₂ loop from electricity to electricity Synthesis/use of H ₂ with <u>efficient or uncostly or green</u> electrolysis & FC. TRL 3-6
?	?	?
		<p>Green Fuel Cell (FC) and electrolyser having high efficiencies</p> <p>AND scalable for small production units (~ 65 000 kWh/year).</p>
	Matgenix B	SME Ab-initio technique for Modeling and proposing new porous structures for H ₂ applications (storage, ...). Modeling of H ₂ sorption mechanism in porous structures;
	ATM-Pro B	SME Modeling of atmospheric predictions (in B & CH). Green electricity producer and consumer. SME test site. Modeling for H ₂ production & storage fluxes and constrains focusing on SME requirements Tests at TRL 3-6.



Thank you !

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