





AFC Advanced Fuel Cells

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WaterstofNet

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IEA Advanced Fuel Cells



IEA Advanced Fuel Cells


- Technology:

■ Annex 22	PEFC	USA
■ Annex 23	MCFC	Korea
■ Annex 24	SOFC	Finland

- Applications:

■ Annex 25	Stationary	Sweden
■ Annex 26	Transport	US/DoE
■ Annex 27	Portable	Germany

www.ieafuelcell.com



Annex 25: Participants

- **Germany**
FZJ Jülich
- **Japan**
Technova (NEDO)
Panasonic, Aisin Seiki,
Toshiba
- **USA**
DOE, EPRI, PNNL
guest UTC Power
- **Sweden,**
Operating Agent, Grontmij AB
- **Italy**
ENEA
- **France**
GDF-Suez
- **Finland**
VTT, Wärtsilä
- **Switzerland**
Beratung Renz Consulting
- **Denmark**
Haldor Topsø A/S,
Dantherm Power A/S
- **Australia**
CFCL
- **Belgium**
VITO/WaterstofNet
- **Austria**
Austrian Energy Agency
- **Canada** guest
Ballard Power Systems
- The Netherlands has left IEA AFC

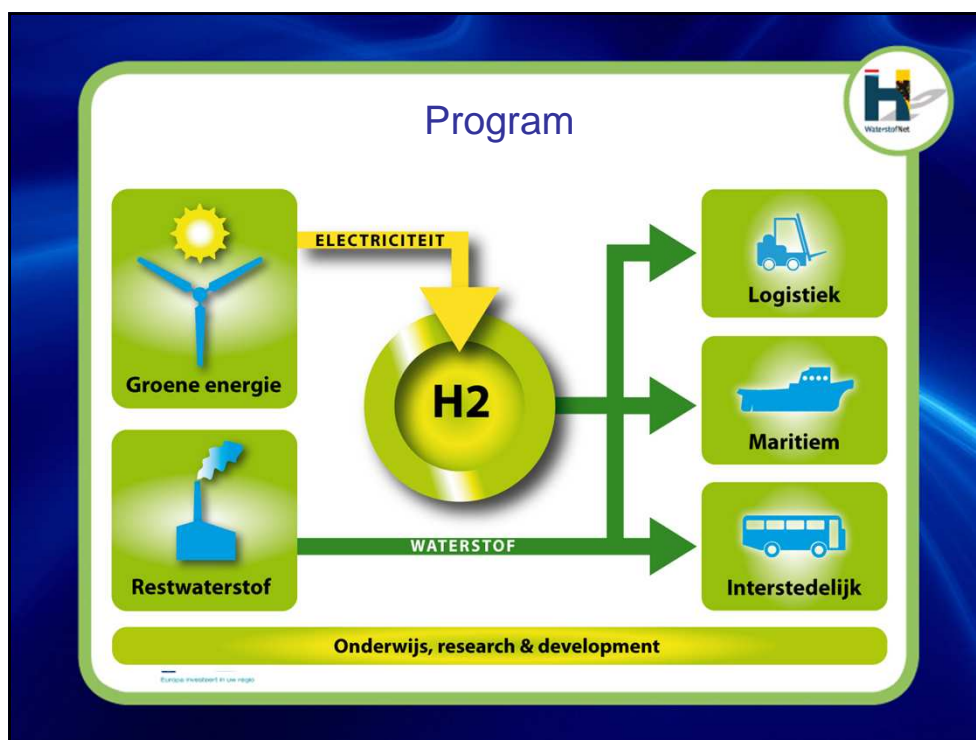
WaterstofNet








- * non-profit organisation (3 persons, started 1/7/2009)
- * Coordinating a 14 M€ regional crossborder (Dutch/Flemish) hydrogen programme, focussed on:
 - * non-fossil fuel based hydrogen
 - * early market applications
 - * education and training programmes
- * because of and in line with Joint Undertaking
- * Involved in European hydrogen projects within JU





Fuel cells in Belgium ?



Met steun van de Vlaamse overheid

Result 1: Byproduct hydrogen



- **Location: Solvay, Antwerp**
- **Suppliers: Solvay (B), Nedstack (NL), MTSA (NL), SolviCore (D)**
- **Complete EU-technology, largest PEM fuel cell plant in the world**
- **Procurement 2010, start up 2011**



Met steun van de Vlaamse overheid

Result 1: Byproduct hydrogen






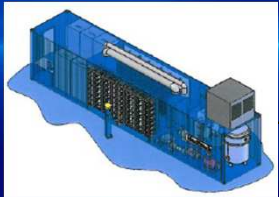



Provincie Vlaanderen Nederland
Europees lidstaat in uw regio


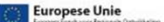


Europese Unie
Europees Fonds voor Regionale Ontwikkeling

Ministerie van Economische Zaken
Met steun van de Vlaamse overheid

1 MW fuel cell: Testing

- 168 stacks Nedstack
- 12600 MEA's Solvicore
- All EU-technology
- Largest in the world

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Europees lidstaat in uw regio

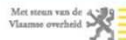
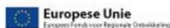
Europese Unie
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Met steun van de Vlaamse overheid

1 MW fuel cell: Testing



1 MW fuel cell: transport



1 MW fuel cell: in operation



Result 1, followed by Joint Undertaking



- High Vlocity: 14 buses, Van Hool, Italy (5), Antwerp (5), Aberdeen (4)
- Antwerp:
 - Solvay builds a hydrogen fuelling station next to 1 MW fuel cell
 - Fuelling station: 200 kg/day, 350 bar, 5 buses
 - Planned to be put in operation half 2013



Result 2: Fuelling station at Colruyt



- Location: Colruyt near Brussels, logistic center
- Green hydrogen : Hydrogenics electrolyser, 350 bar, 70 kg/day
- Applications: fork lifts, car, eventually bus
- Procurement 2010, start up 2011



Result 2: Fuelling station at Colruyt






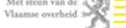
Result 2: Fuelling station at Colruyt

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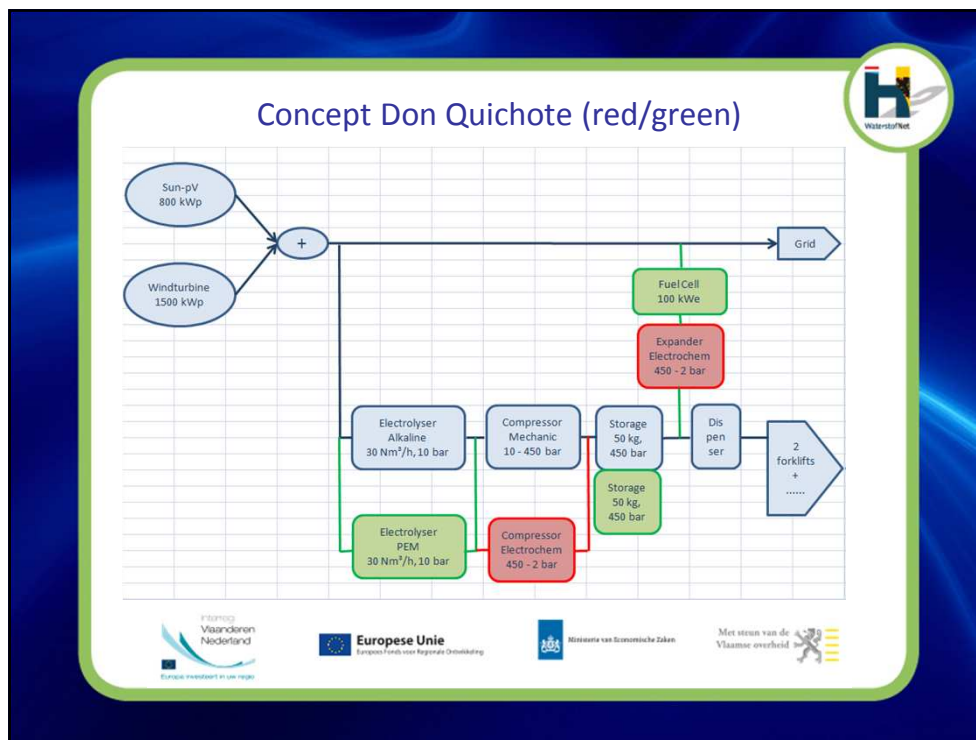





Result 2, followed by Joint Undertaking

- Don Quichote: renewable electricity and hydrogen demonstration
- Technology:
 - alkaline and PEM-electrolyser by Hydrogenics
 - Electrochemical compressor/expander by HyET
 - Location Colruyt-site
 - Project under negotiation

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Belgium and AFC: looking forward

- * Status: Belgium realizes unique fuel cell projects
No research on fuel cells in Belgium
Industrial companies working on fuel cells
- * Added value for Belgium
 - Presentation results in international network
 - Translating international info towards Belgium
 - Discussion cooperation with USA, Japan, Korea
- * Membership fee for Belgium: £ 4.500 / year:
 - member of Exco
 - participating and working in at least one annex







Belgium and AFC: looking forward

- * Because of unique Belgian activities on fuel cells,
WaterstofNet suggest to stay member of AFC
- * Discussion about modalities, tasks, communication,
dissemination






Belgium and AFC: looking forward



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