

# THE GREEN VILLAGE

## The hydrogen distribution grid on The Green Village

A platform for tests and demonstrations  
[www.thegreenvillage.org](http://www.thegreenvillage.org)

HIPS-net, Brussels, 27th June 2019  
Elbert Huijzer, Liander



# The transition to a sustainable future requires an enormous effort



**Renewable  
energy systems**

**Circular  
economy**

**Climate adaptive  
cities**

**Smart  
society**

...

# New solutions face technical, economic and social barriers

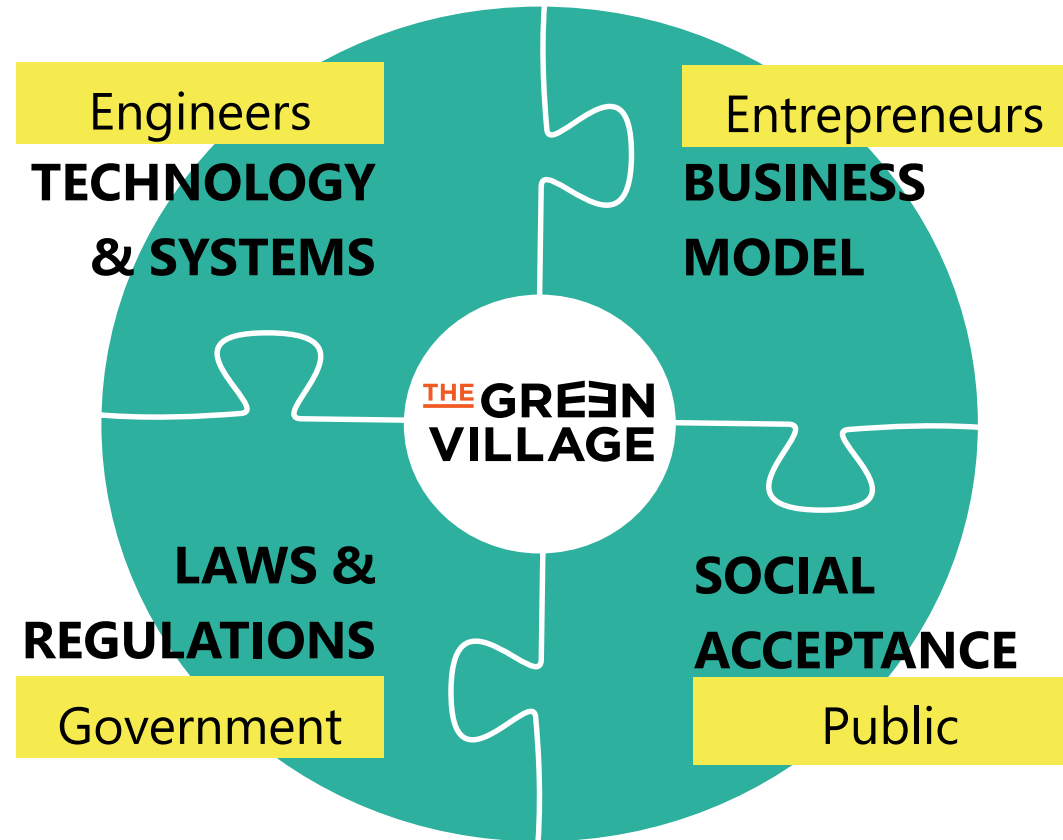


## Technical feasibility unknown

- Effectiveness during use phase insufficiently proven
- Consistency in the practice unclear (e.g. impact on the net)

## Parties are limited

- By Housing Act, Energy Act, Building Decree or standards
- No local exceptions applicable in other municipalities

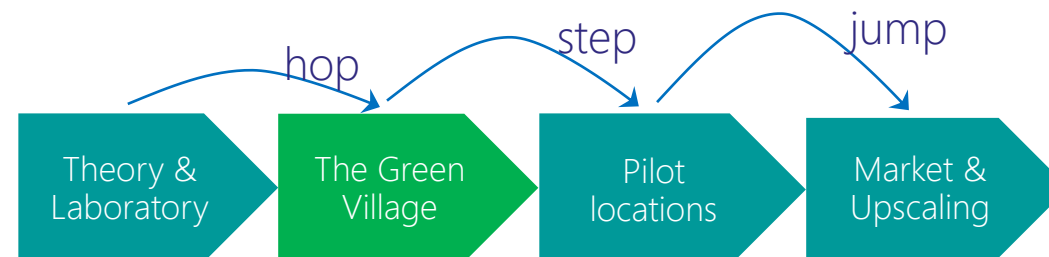


## High investment in R&D

- Storage, energy conversion
- Undermines existing earnings models
- Business cases still uncertain
- Financing solutions are still unattractive

## Limited awareness of the need

- Benefits for residents are unclear
- Residents do not want to be guinea pigs
- Concerns about safety and security and privacy





# Open air laboratory has the advantage of interacting

liander



Open to the public



Flexible infrastructure



Living and working

Staatsblad  
van het Koninkrijk der Nederlanden



Jaargang 2017

275

Besluit van 13 juni 2017 tot wijziging en aanvulling van het Besluit uitvoering Crisis- en herstelwet (Besluit uitvoering Crisis- en herstelwet vijftiende tranche)

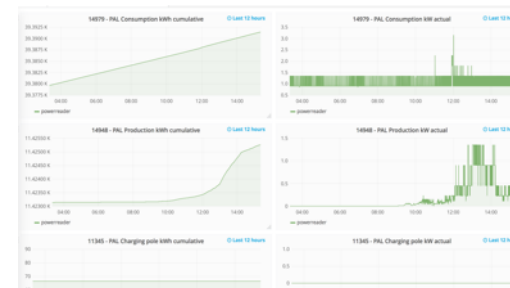
Wij Willem-Alexander, bij de gratie Gods, Koning der Nederlanden, Prins van Oranje-Nassau, enz. enz. enz.

Op de voordracht van Onze Minister van Infrastructuur en Milieu van 13 maart 2017, nr. IuM.029K-2017-02276, Nadattractie Bestuurlijke en

Building decree not applicable



Workshops & matchmaking



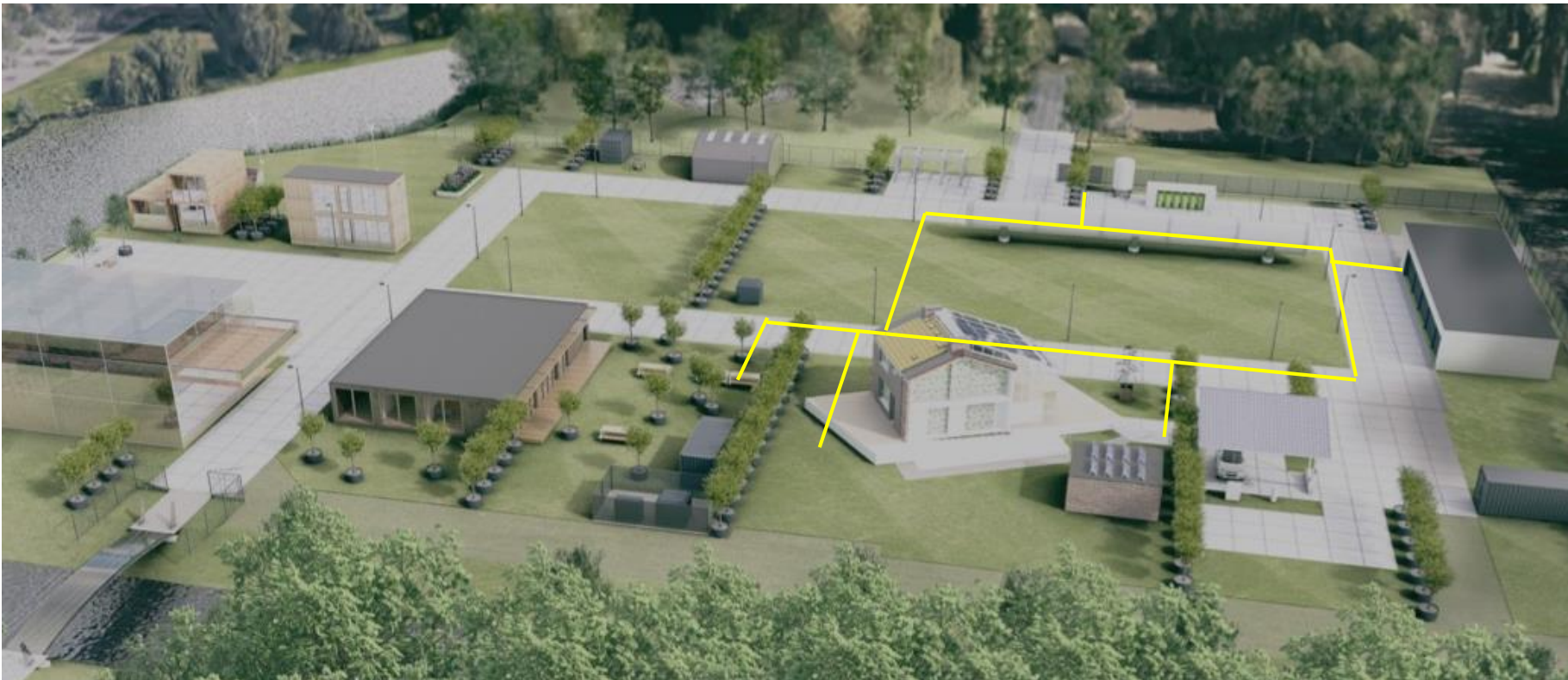
Data platform

# The Green Village – hydrogen grid

Demonstrate and test in an interactive environment



- I. Contribute to an initiative with which we build up knowledge, experience and cooperation in the field of distribution of hydrogen in a natural gas network. We thereby create a platform with which knowledge and experience can be gained in practice.
- II. Creating ambassadorship of the operational divisions within the network operators around hydrogen.





# Staging of the project



## Phase 1: Construction of the grid

- Design of the base grid including house connection.
- Building & Testing
- Operating the hydrogen grid

## Phase 2: Testing

- Development of test area & performing tests
- Platform for tests of other entities

2018

2023





# Research by grid operators



## Develop appropriate security measures

- Outflow
- Spread in case of leakage
- Smellability
- Human actions

## Developing standards and quality marks

- Excavation work
- Additions to Safety Instructions for Natural Gas
- NEN standardization (stations, pipes, meter boxes)

## Validation in practice (knowledge and experience)

- Become familiar with material
- Consequences of higher flow rates
- Experience of engineers and residents
- Create social support



# Research by other entities

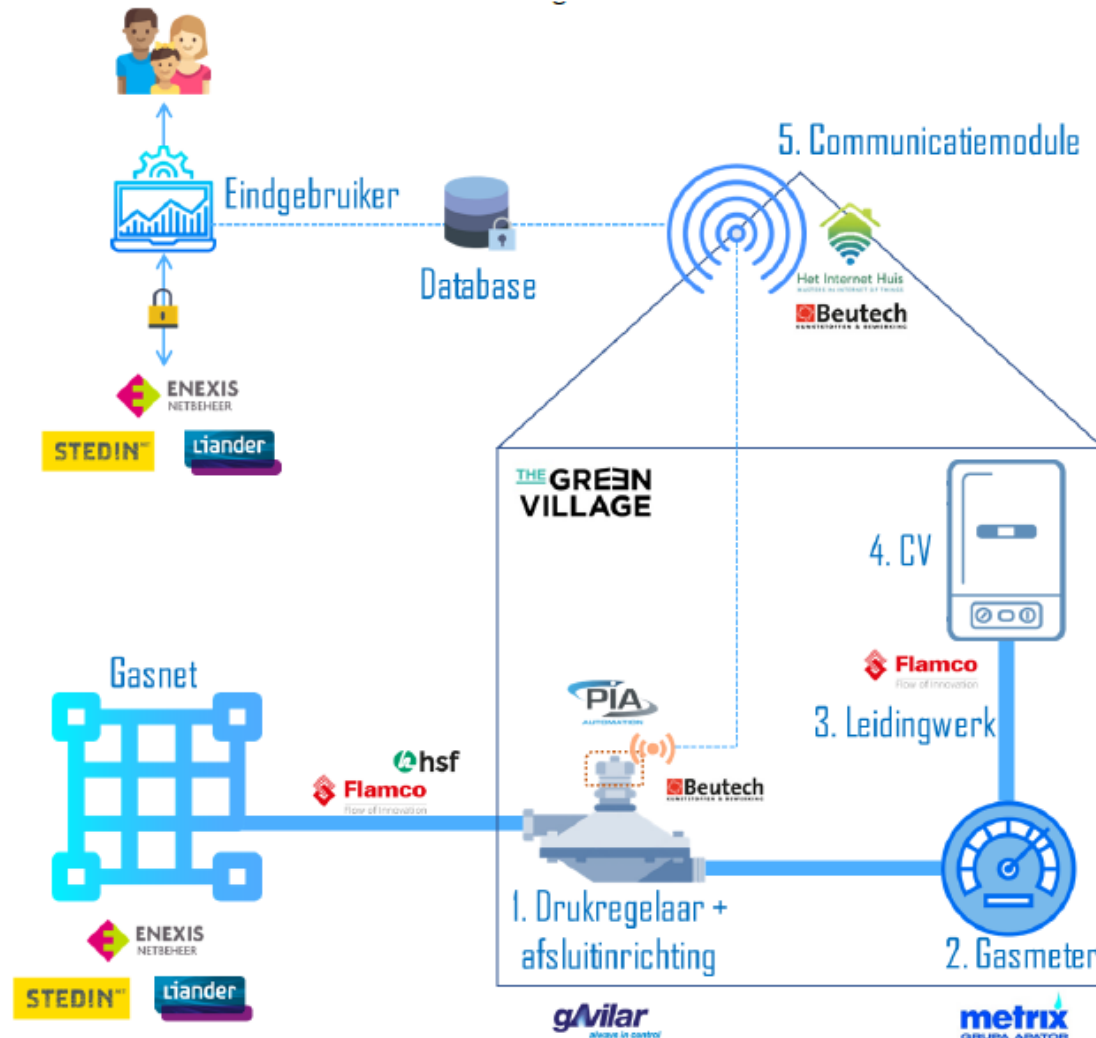
Example of project in preparation: H2@Home

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## H2@Home

Focusing on indoor use:

- Pressure regulator
- Gas metering
- Indoor piping
- Heating boiler
- IT platform





# But there is delay ...



## Permitting

- Speaking 'different languages' (technical or legal)
- No framework of regulations or standards to apply to
- Complexity in responsibilities on TGV

## Delivery of feed-in installation

- Speaking 'different languages' (industrial or built environment)
- No framework of regulations or standards to apply to
- For the producer a standard product, for the buyer a first product ever.

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