

Case study Rotterdam, Netherlands

荷兰,鹿特丹的案例分析

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VISION

愿景

Global Issues

Local Solutions

全球性问题

局部解决方案

Supply 供应

Primary energy 一次能源

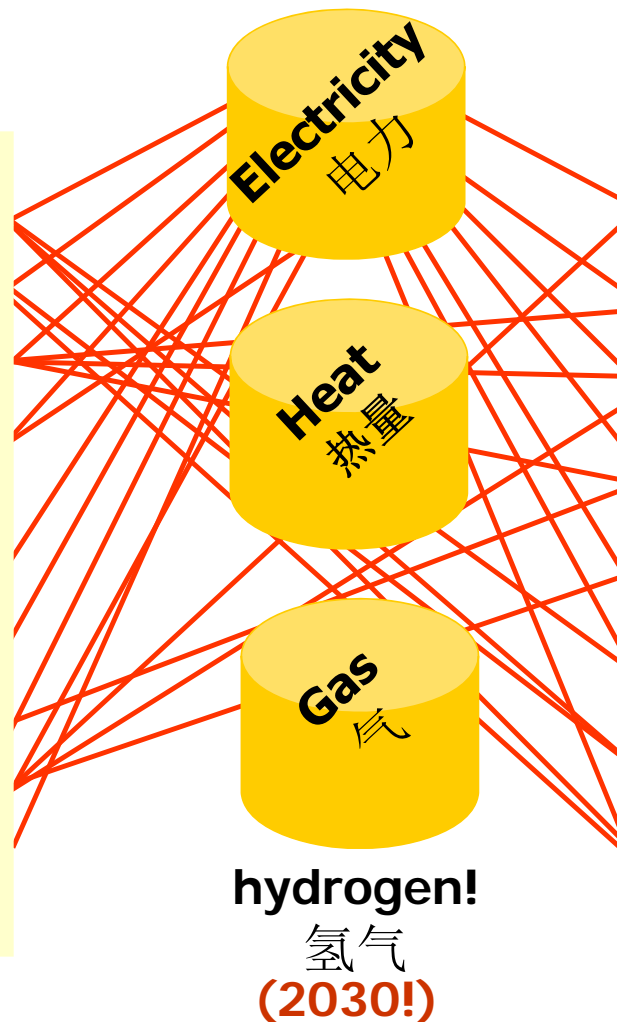
Oil 油
Coal 煤矿
Gas 气
Nuclear 核能

Hydro 水电
Biomass 生物质
Wind 风能
Solar 太阳能
...

Demand 需求

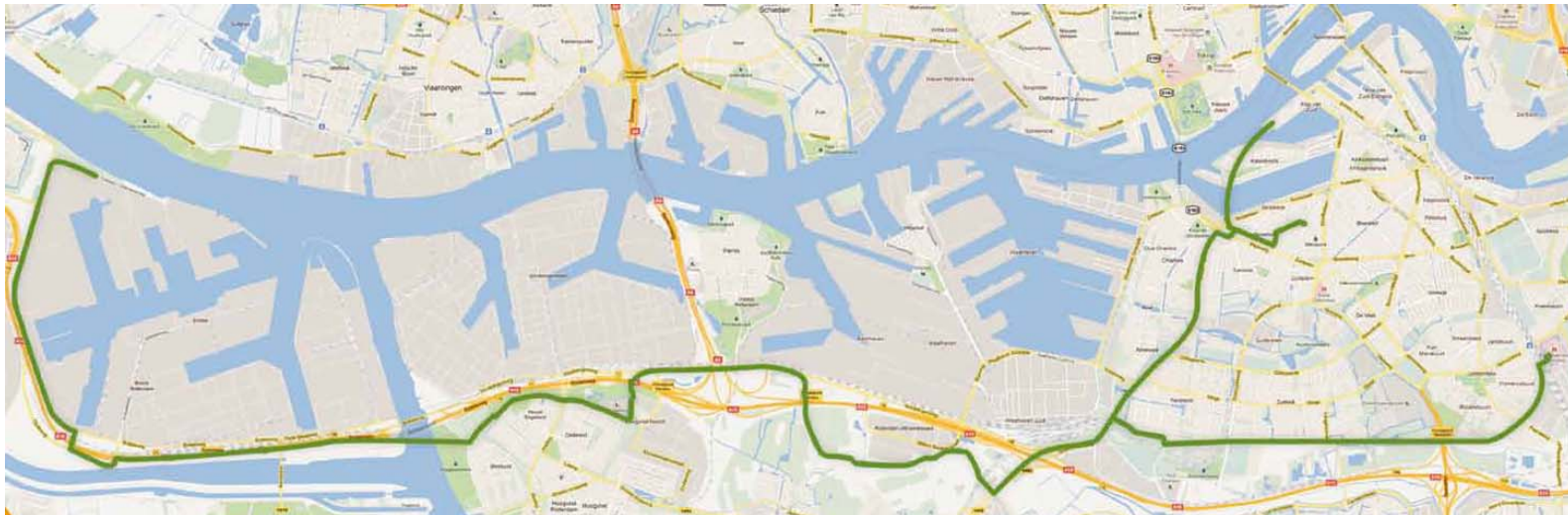
Energy uses 能源利用

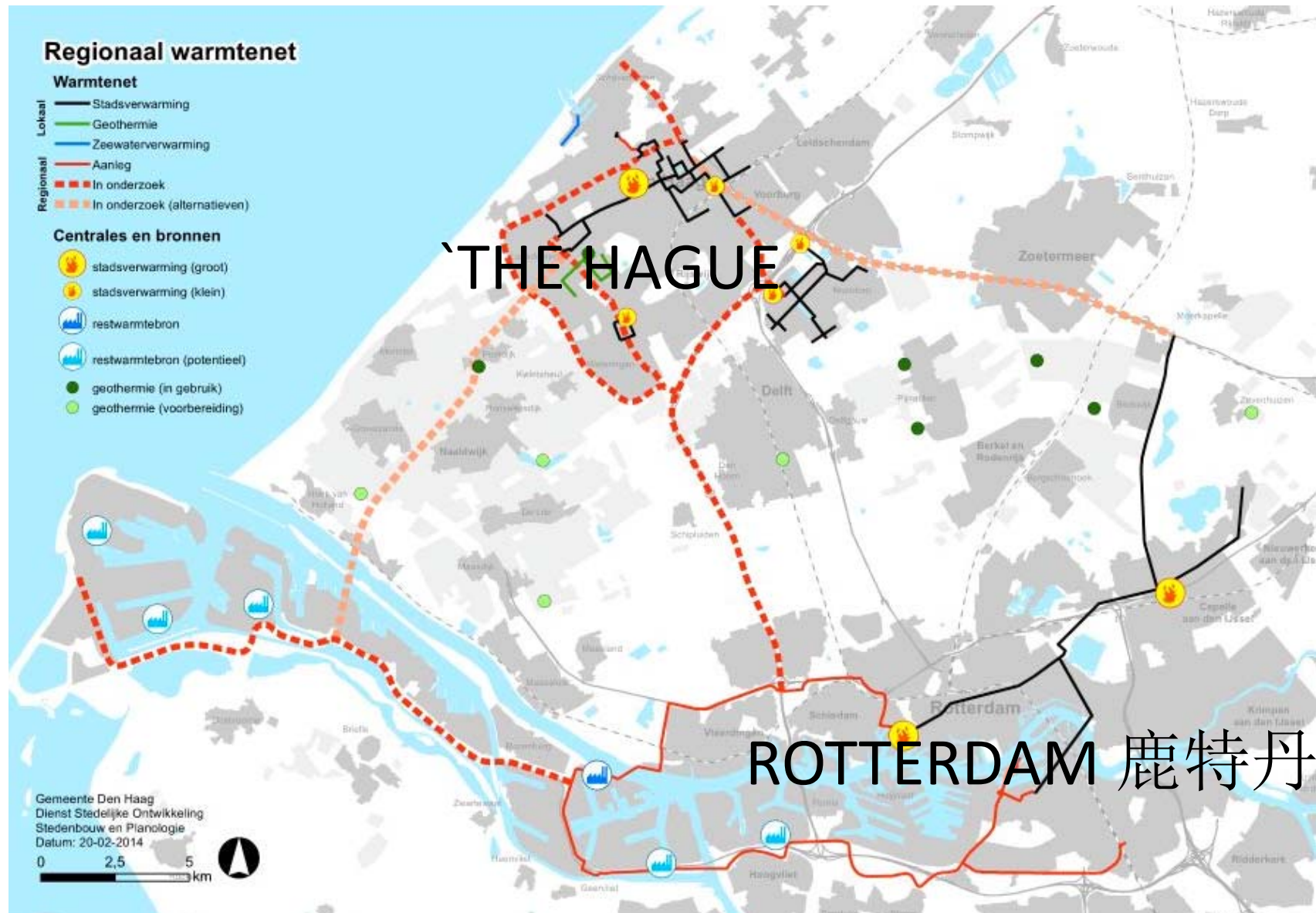
Lighting 照明
Ventilation 通气量
Cooling 冷却
Heating 供热
Washing 洗涤
Multimedia 多媒体
Mobility 流动性
Industrial 产业



Rotterdam district heating

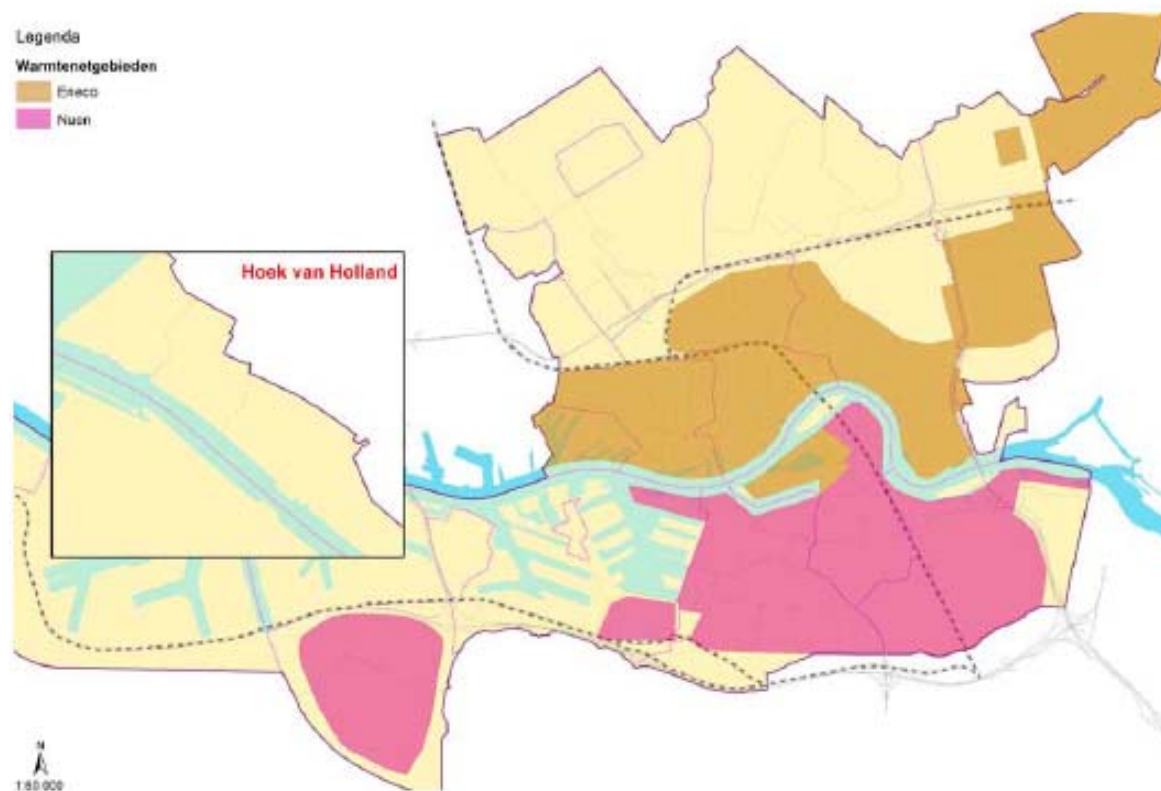
鹿特丹的地区供暖





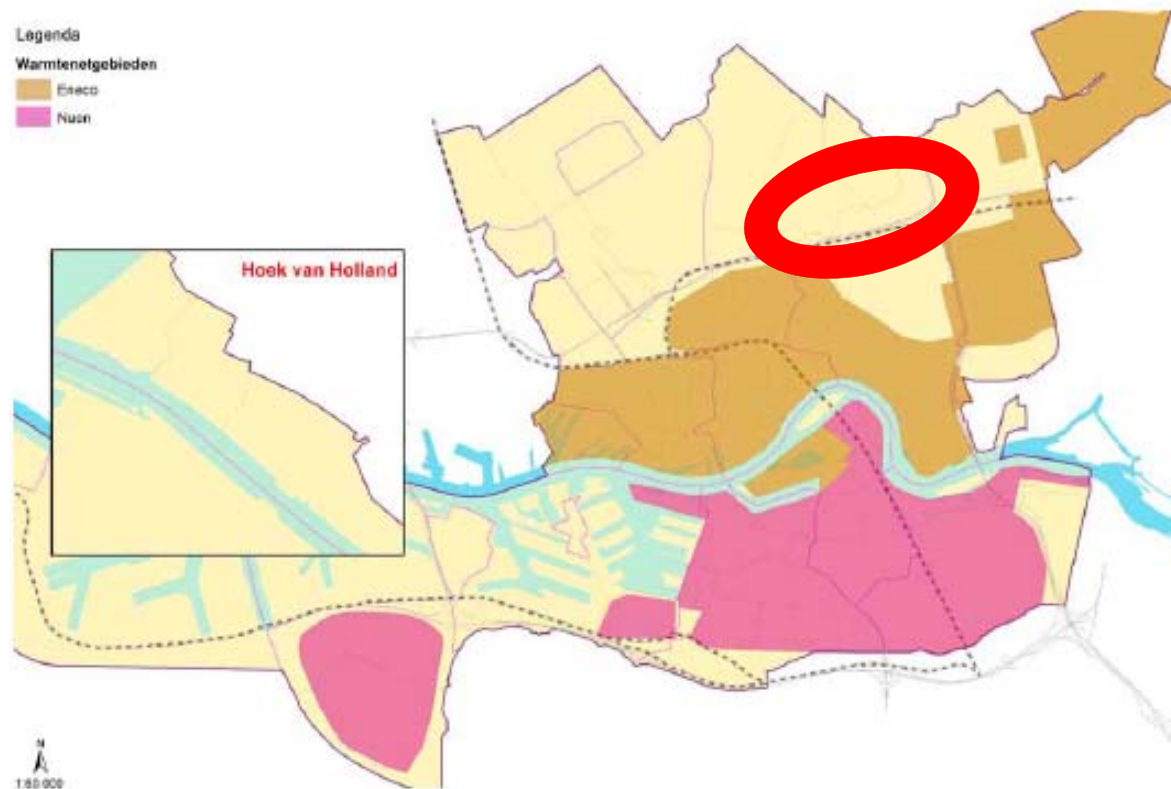
Rotterdam district heating areas

鹿特丹的区域供热面积



Nieuw Terbregge – demo zone

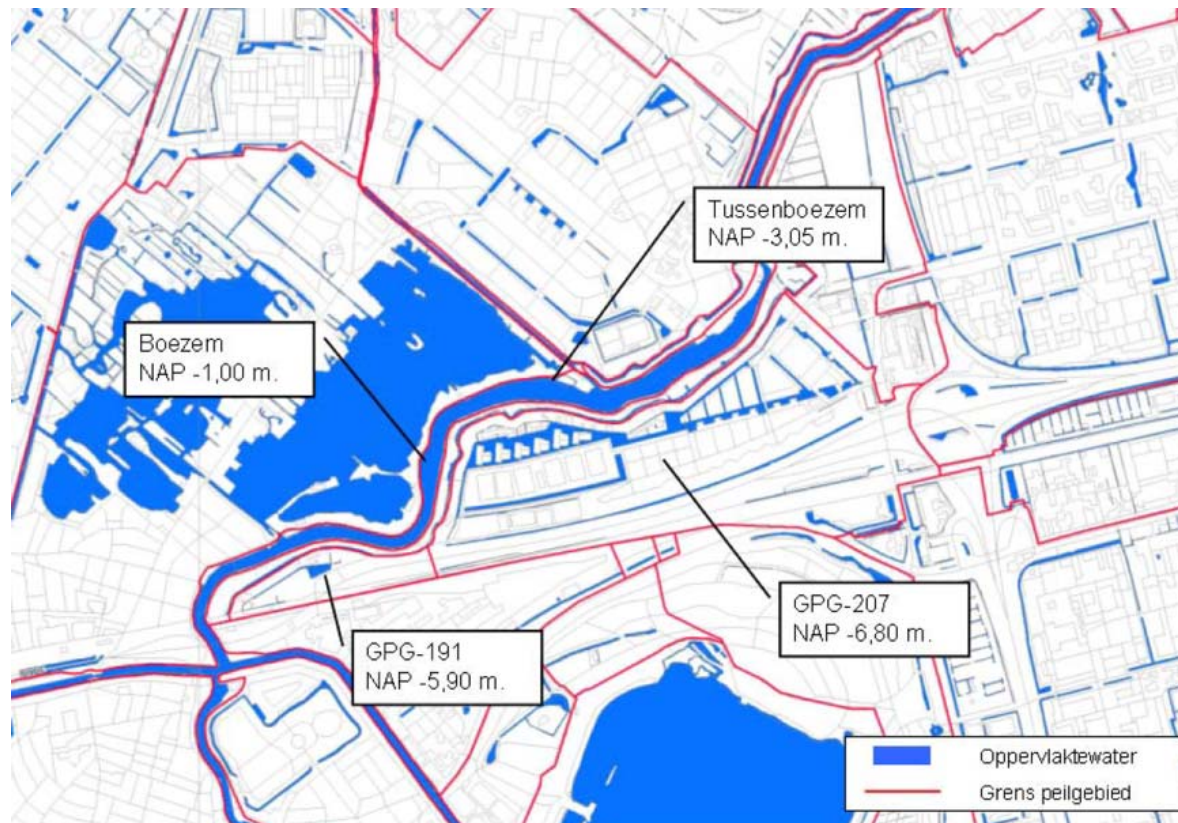
Nieuw Terbregge -示范区





Located below 6.8 meter below
sea level

位于海平面6.8米以下



Rotterdam – energy demo zone

鹿特丹-能源示范区



Rotterdam – energy demo zone

鹿特丹-能源示范区



1

Middle class housing co-generation

中产阶层的热电联产住宅



Co-generation for urban block

城市大楼的热电系统





2

Social housing: solar thermal and co-generation

社会住房： 太阳能热利用和热电联产



Solar thermal and co-generation

太阳能热利用和热电联产









3

Middle class housing heat pump and active solar

中产阶级的住房 热泵和主动式太阳能



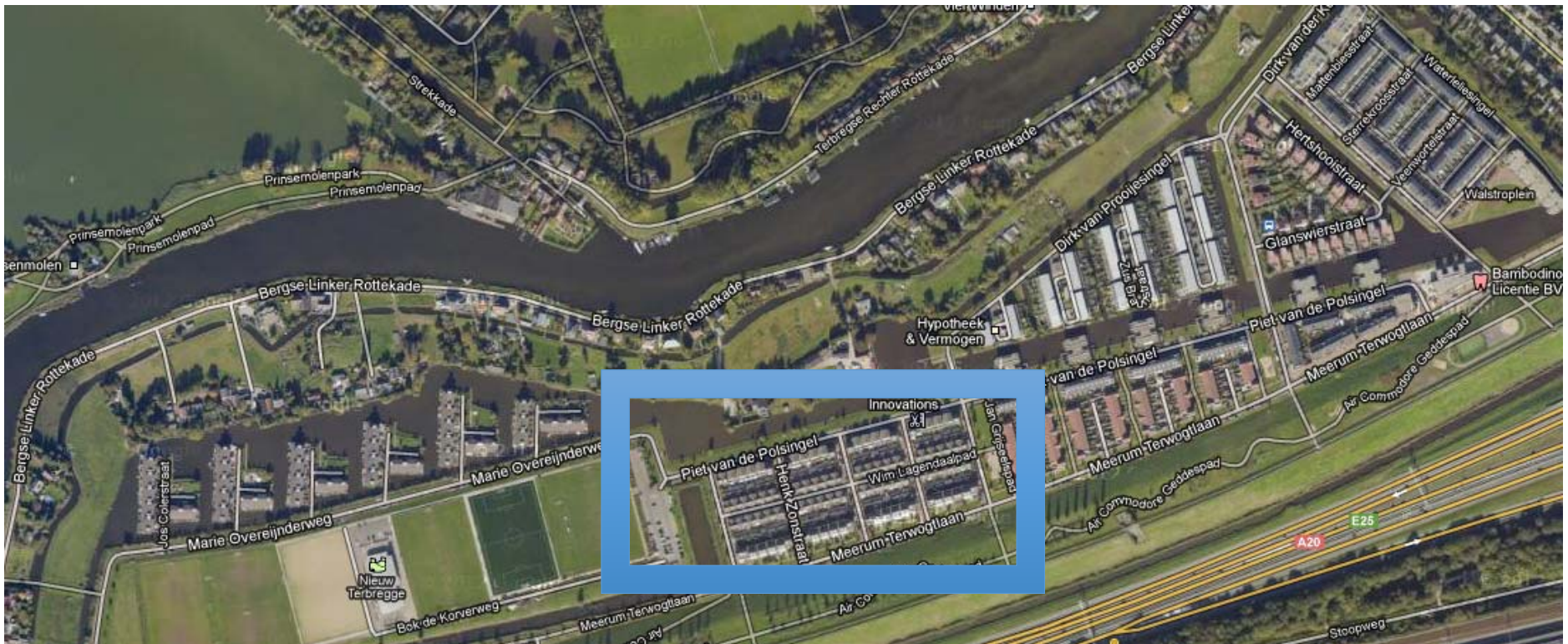




4

Social / middle class housing:
passive and active solar

社会/中产阶级的住宅：
被动式和主动式太阳能





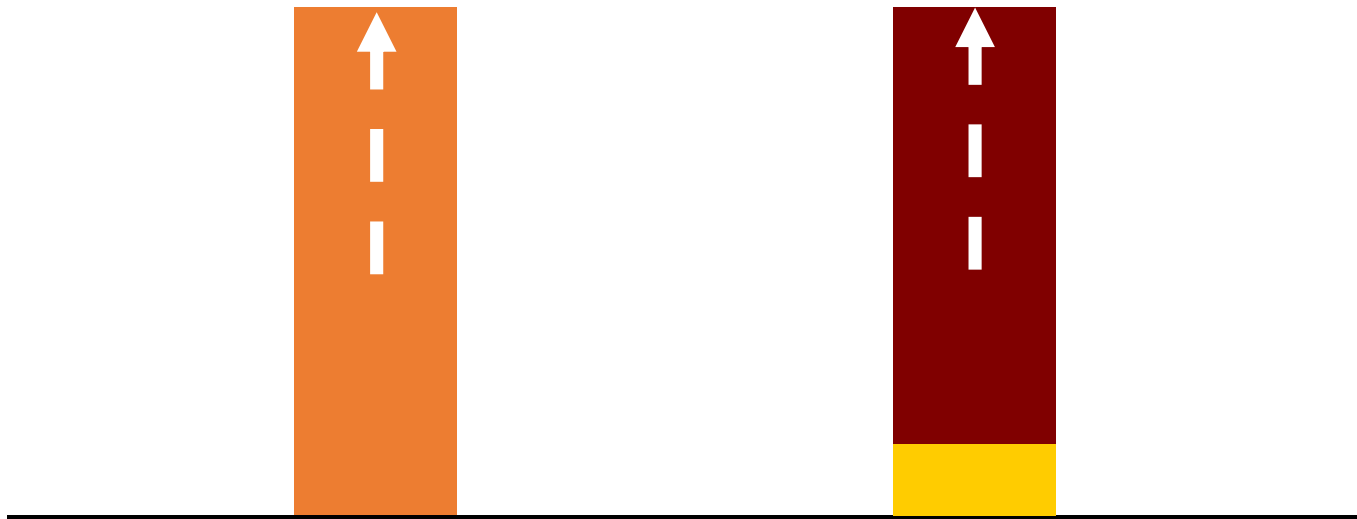


Conclusions

结论

Demand
需求

Supply
供应



Demand
需求

Supply
供应



Demand
需求

Supply
供应



100% ≠ net zero

- All energy carriers are needed: heat, cool, electricity, gas, hydrogen, methane
- 100% renewable sources: solar, wind, biomass, biogas
- Storage only when needed: pumped hydro, heat, gas, ...,
- (batteries – in cars and buses)

100% ≠ 净值为零

- 所有的能源载体都需要：热量，冷，电能，天然气，氢气，甲烷
- 100%可再生能源：太阳能，风能，生物质能，沼气
- 需存储：抽水蓄能，热量，气体，...，
- （电池—在汽车和公共汽车）

From battery to gas storage

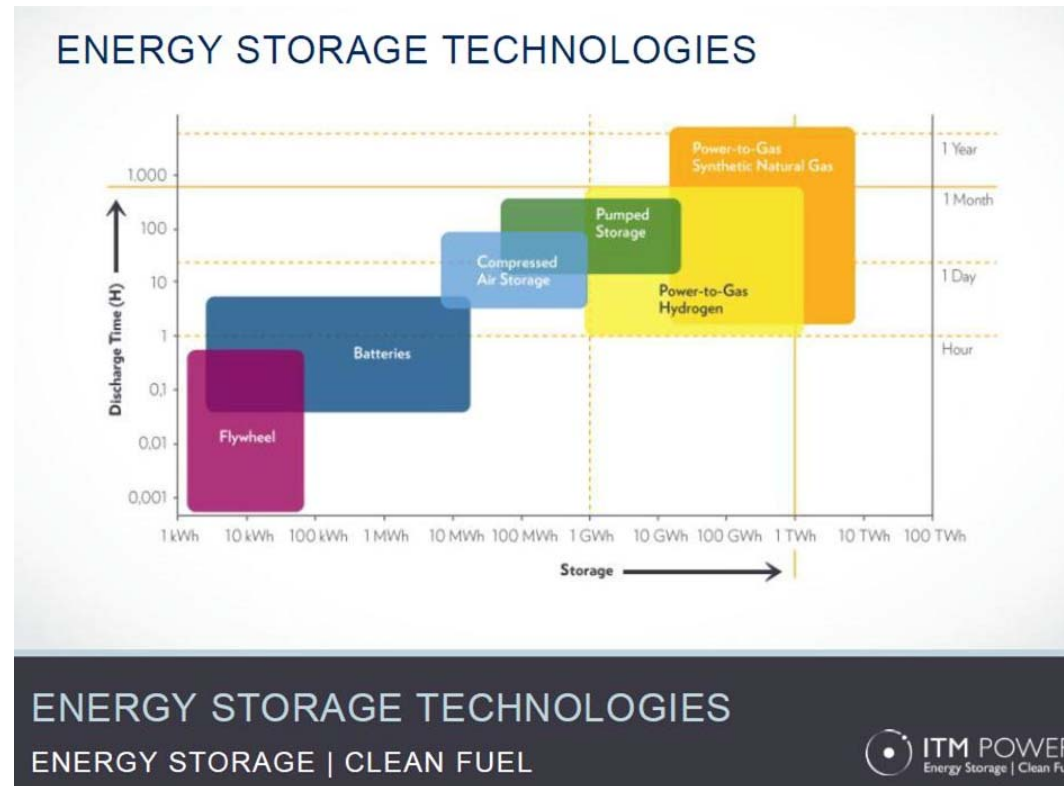
从电池到气体储存

Seasonal storage:
Synthetic natural gas
Hydrogen

Short cycle storage:
battery

季节性储存：
合成天然气
氢气

短周期存储：
电池




At building level

1. A good building envelope
2. An efficient system
3. Renewable energy and storage
4. Community networks and storage
 - Connected in smart energy networks
 - Allow for further development

在建筑水平

- 1、好的建筑围护结构
- 2、一个有效的系统
- 3、可再生能源和存储
- 4、社区网络和存储
 - 连接智能能源网络
 - 允许为进一步发展



You don't have to pay for energy
you don't use

你不必消耗那些你用不着的能源

THANK YOU - 谢谢

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