

<https://www.youtube.com/watch?v=I3WBT2eAArI>



Research Institute Built Environment of Tomorrow

Renovating Europe (and ireland)

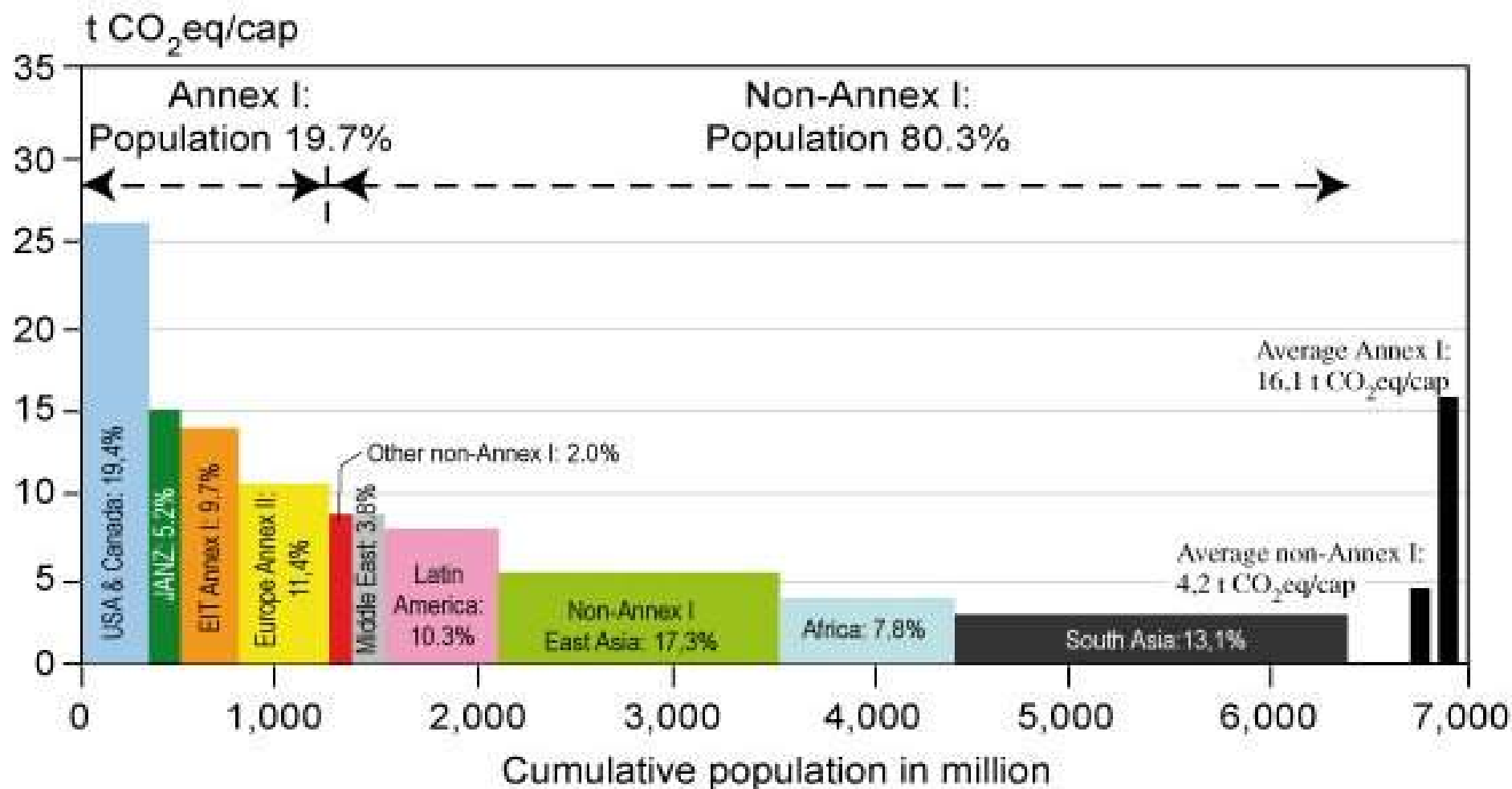
DEEPER – FASTER - BETTER

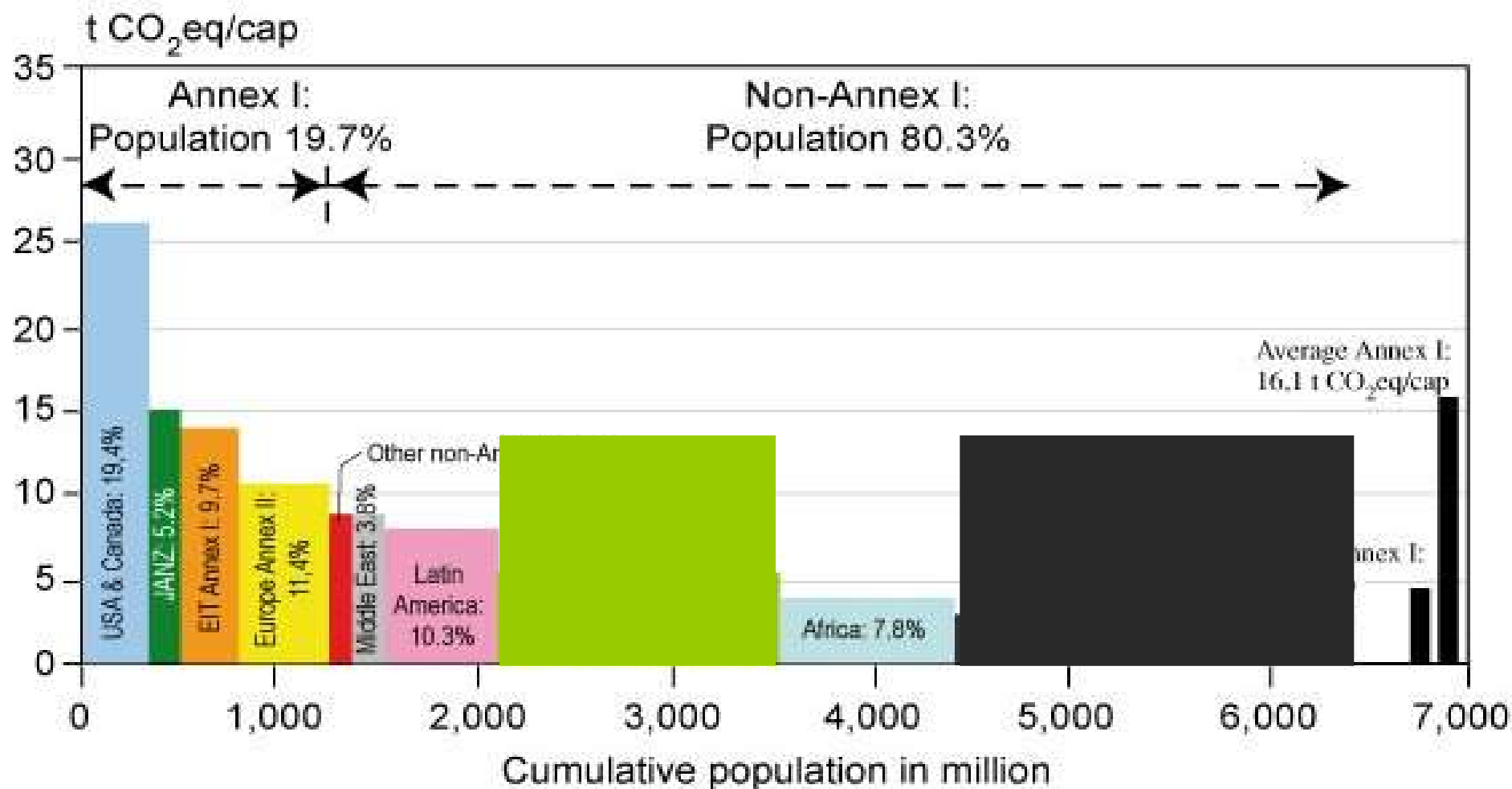
Ronald Rovers,
Director SBS consultancy
Professor (sustainable) Built Environment

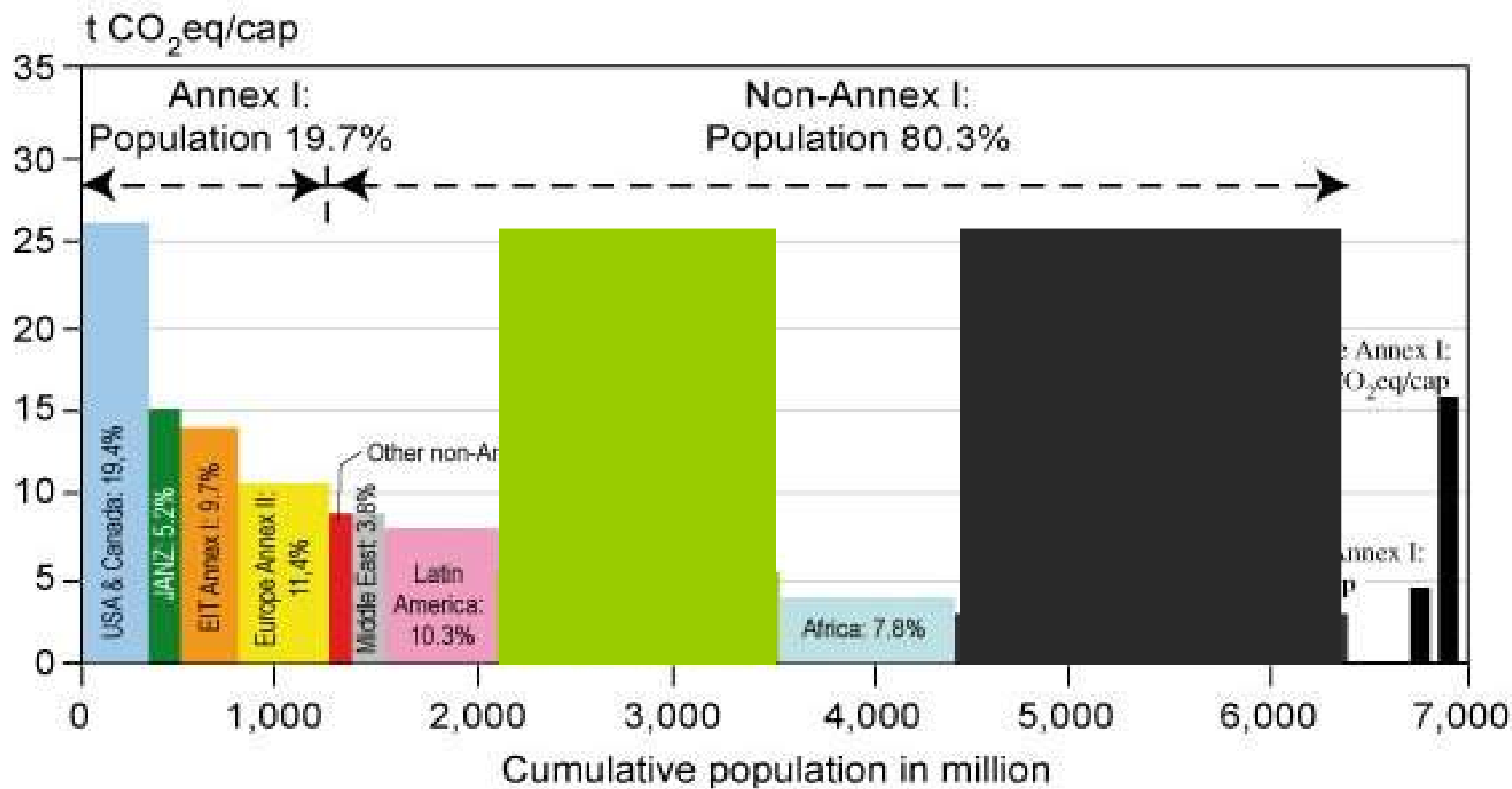


Sustainable Building Support and consultancy,

www.sustainablebuilding.eu @ron_rovers







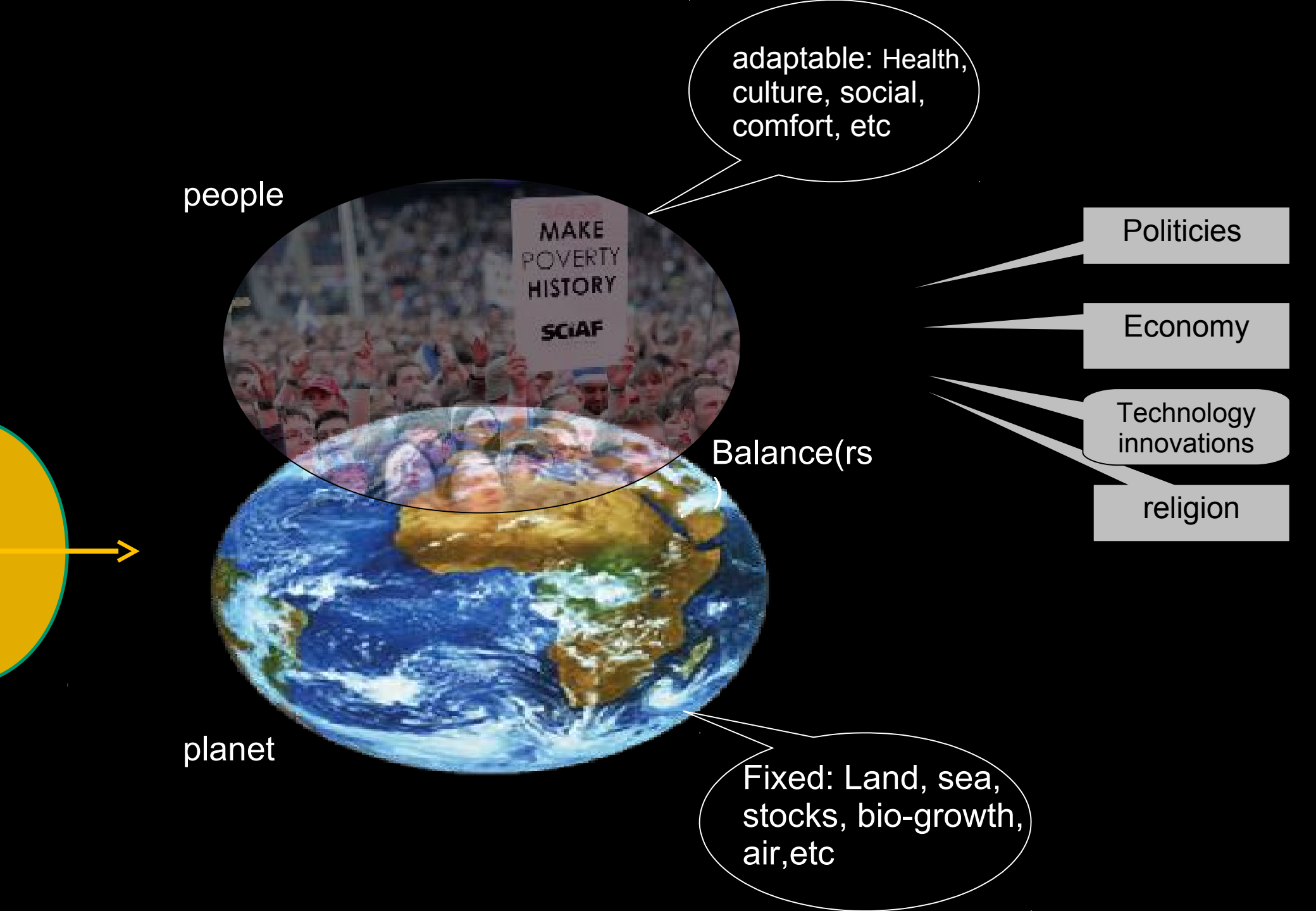






planet

Fixed: Land, sea,
stocks, bio-growth,
air, etc



Summary of transitions required :

From:

Fossil energy
New construction
Global growth
Depletion
Goods
Care
Monofunctional
CO2 strategy
Traditional materials
individual
Entropy increase
etc ...

to:

— renewable energy
— (re-)development existing construction
— local welfare
— renewal
— Services
— Pre-Care
— integration
— landuse strategy
— biobased materials
— collective
exergy increase
—
—

DIRECTIVE 2010/31/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 19 May 2010

on the energy performance of buildings

(recast)

19.6.2010

EN

Official Journal of the European Union

L 153/21

Member States shall in addition take the necessary measures to ensure that when a building element that forms part of the building envelope and has a significant impact on the energy performance of the building envelope, is retrofitted or replaced, the energy performance of the building element meets minimum energy performance requirements in so far as this is technically, functionally and economically feasible.

Member States shall determine these minimum energy performance requirements in accordance with Article 4.

Member States shall encourage, in relation to buildings undergoing major renovation, the consideration and taking into account of high efficiency alternative systems, as referred to in Article 6(1), in so far as this is technically, functionally and economically feasible.

Article 8

Technical building systems

1. Member States shall, for the purpose of optimising the

encourage, where appropriate, the installation of active control systems such as automation, control and monitoring systems that aim to save energy.

Article 9

Nearly zero energy buildings

1. Member States shall ensure that:

(a) by 31 December 2020, all new buildings are nearly zero-energy buildings, and

(b) after 31 December 2018, new buildings occupied and owned by public authorities are nearly zero-energy buildings.

Member States shall draw up national plans for increasing the number of nearly zero-energy buildings. These national plans

The screenshot shows the top part of the Europe 2020 website. At the top left is the European Commission logo. Below it, the text 'Europe 2020' is displayed. The main content area features a blue header with the text 'Europe 2020' and 'A resource-efficient Europe'. Below this, there is a section titled 'A resource-efficient Europe – Flagship initiative of the Europe 2020 Strategy'. The text in this section discusses the importance of resource efficiency for economic growth and job creation, and mentions the 'Roadmap for a resource-efficient Europe'.

EUROPE 2020
A resource-efficient Europe – Flagship initiative of the Europe 2020 Strategy

The Roadmap for a resource-efficient Europe under the Europe 2020 strategy supports the shift to a resource-efficient, low-carbon and green economy, business and economic growth.

Natural resources underpin our economy and our quality of life. Combating our current patterns of excessive resource use will allow us to maximise resource efficiency while still securing growth and jobs for Europe. Smart, long-term economic opportunities, improved productivity, environmental protection and boost competitiveness.

The Roadmap for a resource-efficient Europe provides a long-term framework for a transition to green, smart, and inclusive growth. It includes a strategy for energy, transport, industry, raw materials, agriculture, fisheries, biodiversity and regional development. It also includes a set of principles for investment and financing to ensure that all relevant policies take into account resource efficiency in a balanced manner.

Key proposals/road maps:

Energy 2020: A strategy for competitive, sustainable and secure energy

Energy infrastructure priorities for 2020 and beyond – A Blueprint for an integrated European energy network
Tackling the challenges in commodity markets and on raw materials

Low-carbon economy 2050 roadmap

European Energy Efficiency Plan 2020

White Paper on the future of transport

2020 EU biodiversity policy and strategy

Revision of the Energy Taxation Directive

Roadmap for a resource-efficient Europe

Common Agricultural Policy Reform

Common Fisheries Policy Reform

Cohesion Policy Reform

Energy infrastructure package

Trans-European Networks for Transport (TEN-T) revision

Energy Roadmap 2050

Security of energy supply and international cooperation

Review of priority substances mentioned in the Water Framework Directive

Framework Directive

20-20-20 targets: for 2020

20% Renewable energy

20% CO2 reduction

20 % energy reduction

We need a Europe Make Over:

Reorganisation of functions,
servicing,
Large scale serial renovation,
biobased
economy, therefore development
in
stead of pure growth.

Europe: there are 255 million houses in EU:
20% target by 2010:

To meet that for the housing sector , either:
Improve all house with 20% energy
reduction(50 million a year..)

Or retrofit 20% of all houses to 0-energy
(10 million a year)

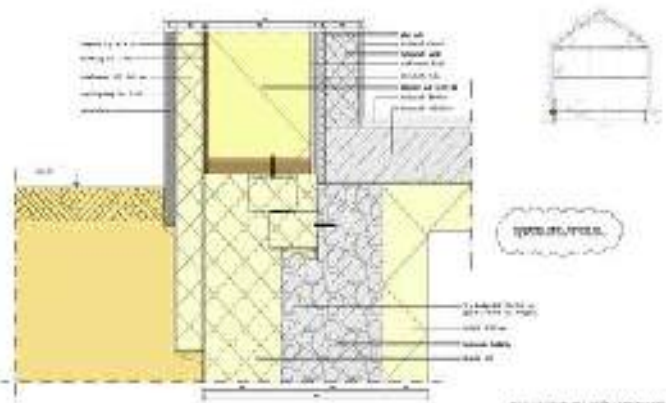
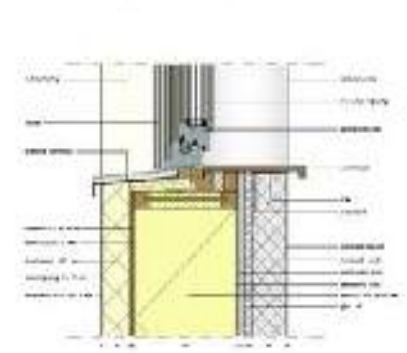
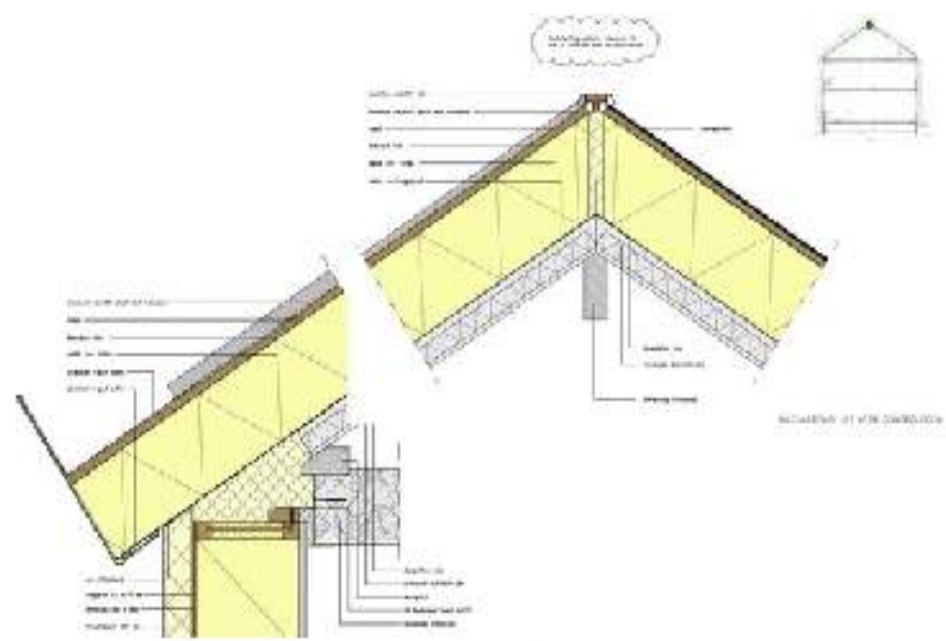
Continued to 2050 , to have all houses 0-
energy, and
have met RE production targets as well.

Industry:

- Prefabrication
- Innovation for fast retrofits
- Chain co-operation, no single business models anymore
- Larger content part from reuse and recycling
- Increasing part of renewable materials (Biobased)
- Servicing your product: life long responsibility

A first full make over in inhabited
state, in 10 days:
Kerkrade, NL











1 prefab scaffolding moved
from 10th to 1st in line

2 houses stay inhabited
during works

3 BIPV: the PV is the actual
watertight roof cover







KW1 general overview:

<https://www.youtube.com/watch?v=A7MDLd0Q9Xs>

[DdeLink__2838_325144642https://www.youtube.com/watch?v=mveOQTxFRYE](https://www.youtube.com/watch?v=mveOQTxFRYE)

many small instruction videos were made for the inhabitants: here is an example, cleaning the ventilation inlets:

<https://www.youtube.com/watch?v=0k56uttnnKw>

And:

<https://www.youtube.com/watch?v=mveOQTxFRYE>

the follow up project/green deal:

overview of pictures of the pilot houses First part is the original Kerkrade project, then Minister visiting the project, and second part the 4 test houses for the 100,000 renovation plan.

<https://secure.flickr.com/photos/111630915@N04>

pilot in two days for 1 of the 4 test houses: Melick, by Wonen Limburg corporation and Volker-Wessels consortium:

<http://www.wonenlimburg.nl/Project-de-Stroomversnelling>

the 2nd project of 4 test houses in Arnhem:

<https://www.youtube.com/watch?v=qRCGZ6Y0ooc>

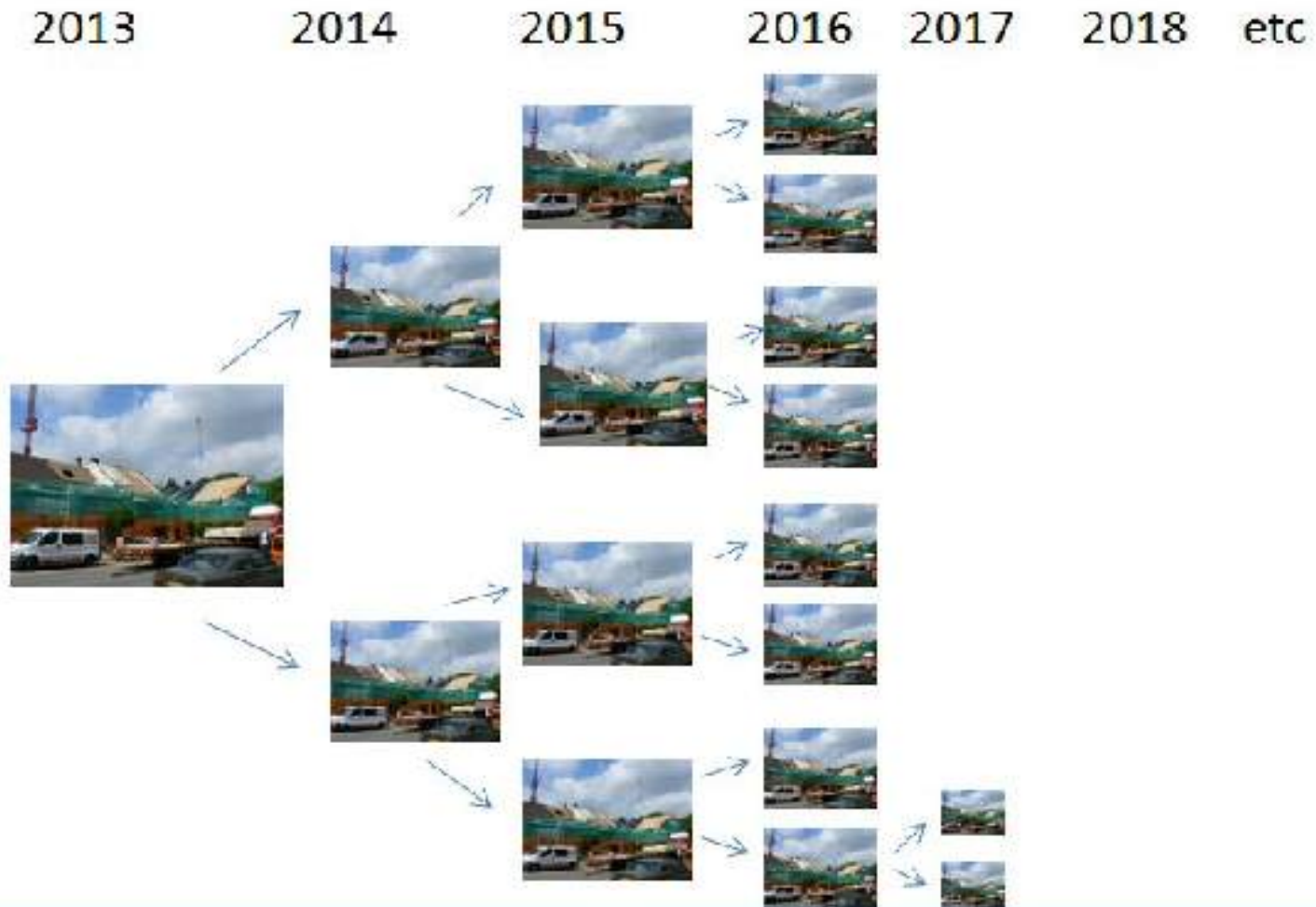
interview about all 4 projects(also known as project 'de stroomversnelling' (renovation 'rapids') :

<https://www.youtube.com/watch?v=QYIXRppjQL0>

We need to upscale renovation very fast, and not focus on

new construction... We have enough empty buildings

From 1 renovation-train to 2, to 4, to 8, to 16, etc:



Conclusions:

- The 10 days should go down, to 3? 2? , maybe 1?
- Costs should go down, to below monthly energy payement equivalent for a loan
- performance should be guaranteed,
- Reduced presence of workers in the house
- More integration and prefabrication

Requiring substantial innovation and a substantial market:

Its a paradiqm shift in market functioning

Time for a new initiative:

“**Stroomversnelling**”:

(river “rapid”: increased speed of adaptation)

4 combinations of principals (social housing corporations) and construction companies, joined a green deal programme.

2 rounds of pilots and then upscaling to 100 and later 1000 and 10000 houses.

Joint innovation and piloting

Its a paradigm shift in market fu



Melick, 1st round prototype



Melick, 1st round prototype



Melick, 1st round prototype



Melick 1e ronde



Melick round 1 bam

Nieuw buinen 2e round prototype





Tiwos tilburg pilot

Melick 2e round
VW





Melick 3e round
D-V





Groningen
multifamily
house D-V



Nieuw Buinen: installations
In white tower

<https://www.youtube.com/watch?v=I3WBT2eAArI>



KW1 general overview:

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And:

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About the last shown project: <https://www.youtube.com/watch?v=I3WBT2eAArI>

Others about the follow up project/green deal:

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Why does it work?

Market

Construction companies were convinced of the potential to transferring a multi-billion annual collective household energy bill into a new market for the construction sector.

If that works, the refurbishment market would be much bigger than any construction company could deal with on its own.

Independent

The Independent Programme office 'energiesprong' motivates the construction sector to deliver improved solutions, to encourage government to lift regulatory barriers and drive financiers to re-evaluate financing conditions.

Consortia

It succeeded in motivating the first construction companies (which formed consortia of suppliers and developers) to do the required investment in further

Current Technical work:

- integrate installations in prefab panels
- Miniaturize components, like heat pumps, heat exchangers etc
- Develop solutions for integrated stability support
- Series of 1
- 1 day make overs
- gallery style multifamily blocks

Next:

Green deal “stroomversnelling” : private homeowner sector.

building permits: now negotiating with municipalities for a 1 day building permit process on the basis of a ready product catalogue

Ambition: A quick to install product with a warranty is now emerging,

next challenge: how do we get these solutions sold in a shop, in the same way IKEA sells its kitchens?

Reduce the investments cost to within the business case. 45000 euro

the 111 000 deal alone creates 9000 extra jobs between 2015 and 2020. The reason is simple: the employment per euro spent on energy bills is much lower than the



Participants private sector



DOE DE CHECK



Welk type woning?

UW RESULTAAT

WILT U IN AANMERKING KOMEN VOOR DE PILOTFASE?

Model Energy Performance Contract

Pag1/4

DE ONDERGETEKENDEN

[aanbieder], statutair gevestigd te [plaats] en kantoorhoudende te [(postcode) plaats] aan [adres] (de "Aanbieder") en

[naam], wonende te [(postcode) plaats] aan [adres] (de "Eigenaar")

VERKLAREN ALS VOLGT TE ZIJN OVEREENGEKOMEN:

Artikel 1. Onderwerp van deze overeenkomst

Deze overeenkomst heeft betrekking op de prestaties van product [ABC], gekocht door de Eigenaar en uitgeveerd op woning [Straatnaam, nummer, woonplaats], compleet afgeleverd op [datum, jaartal].

De prestaties van [ABC] maken deel uit van een separate koopovereenkomst. Met de aflevering is die koopovereenkomst uitgekomen. Vanaf dat moment geldt deze overeenkomst in.

De Aanbieder garandeert de Eigenaar en ook opvolgende eigenaars de prestaties van product [ABC] op de woning gedurende een termijn van 15 jaar vanaf bovengenoemde afleveringsdatum.

Deze prestaties zijn:

Tabel 1: Factories van de woning

Factories	Waarde	Eenheden
Energie		
Minimale voor eigen gebruik opgewekte duurzame energie	[B]	kWh/j
Waarvan maximaal benodigd voor gebouwgebonden energiegebruik	[C]	kWh/j
Waarvoor minimaal beschikbaar voor huishoudelijk gebruik (gebruiksapparatuur, zoals wasgoed, koken, TV, etc.)	[D]	kWh/j
Comfort		
Minimale hoeveelheid beschikbaar gereguleerd tapwater van minimaal 40 °C aan de kraan	200	Liter/dag
Minimaal haalbare temperatuur keuken en woonkamer	21 ^o	°C
Minimaal haalbare temperatuur slaapkamers	18	°C
Maximaal aantal uren verlichtingsruimte boven de 26 °C in de zomer	150 ^o	Uren
Minimale ventilatievoorziening	Nieuwbouw niveau ^o	
Binnenmilieu		
Minimaal percentage van de tijd CO ₂ gehalte beneden de 1200 PPM	95% ^o	
Daglichtniveaus	Conform wettelijke	

nieuws stroom

Magazine voor alle in de bouw en vastgoed
aankomende wijzigingen — 100000 1.1.2015

Bewoners aan het woord

'Net een nieuw huis, perfect'

Slim en snel
binnen de kaders

Regelgeving bij grote bouw- en
renovatieprojecten

Unieke samenwerking

**Volledig transparant
kennis uitwisselen**

nieuws stroom

Other
initiatives:

Urgenda



PRAKTIJKYDORBEELDEN VAN BESTAANDE WONINGEN

“Our house 0-energy! “

35000 Euro

Programme by Urgenda
(NGO)

The Netherlands

Mainly technical
/equipment measures

Which shifts the impact to
materials , metals mainly



'WIJ ZIJN GRAAG EEN 'TEST-CASE'
EN EEN VOORBEELD VOOR ANDEREN.'

Maatregelen

Kosten materiaal en arbeid per
maatregel (Inclusief BTW)

> 21 zonnepanelen 255 Wp	€ 9.000
> Eco-boiler	€ 2.100
> 7 Infraroodpanelen	€ 5.050
> Advies- en installatiekosten	€ 2.350
Totaal	€18.500

Het huis van de familie Rüter zou met nog acht extra zonnepanelen energieneutraal zijn. Op dit moment is hiervoor niet genoeg eigen dakoppervlak beschikbaar. De familie overweegt mee te doen met een collectieve actie van het platform Zonnepanelendeel. Zij kunnen acht zonnepanelen leggen op een van de projecten voor € 3.600,- met een rendement van 3% en een teruggave van de investering na vijftien jaar. Daarmee zijn ze klimaatneutraal.

+ additional PV panels to become 0 (no space on roof)

€ 18.500,-



Zwijndrecht BJW



And other companies get organised, like these three, forming the BJW consortium

zwindrecht



Next: **BJW, Jan Kamphuis:**

Energy invoice less (0-energy) is not even the most important for the inhabitants to co-operate: its comfort and style ...

And price/costs turns out to be less important : after calculating a sharp business case for the client, then the client raises the budget for some extras...
(private sector)

bjw
zonder meer thuis



Wonen boven de
hoven

What's next?

MORE_CONNECT EU Horizon 2020 project

: to develop

methodology, guidelines and technology for modular prefab renovation panels .

Around 10 countries participate, in 5 climate regions. Tasks:

- Typologies for housing types will be explored,
- to draft general guidelines and principles for joint prefab panel development.

- (near) 0-energy ambition in the existing building stock, the panels should be part of a total energy concept for houses, including materials energy impact

- A 0-energy approach will become the basis for concept development and modular analyses, whereby each region or country can define how much will be applied in a near 0-energy concept, as agreed in their country.

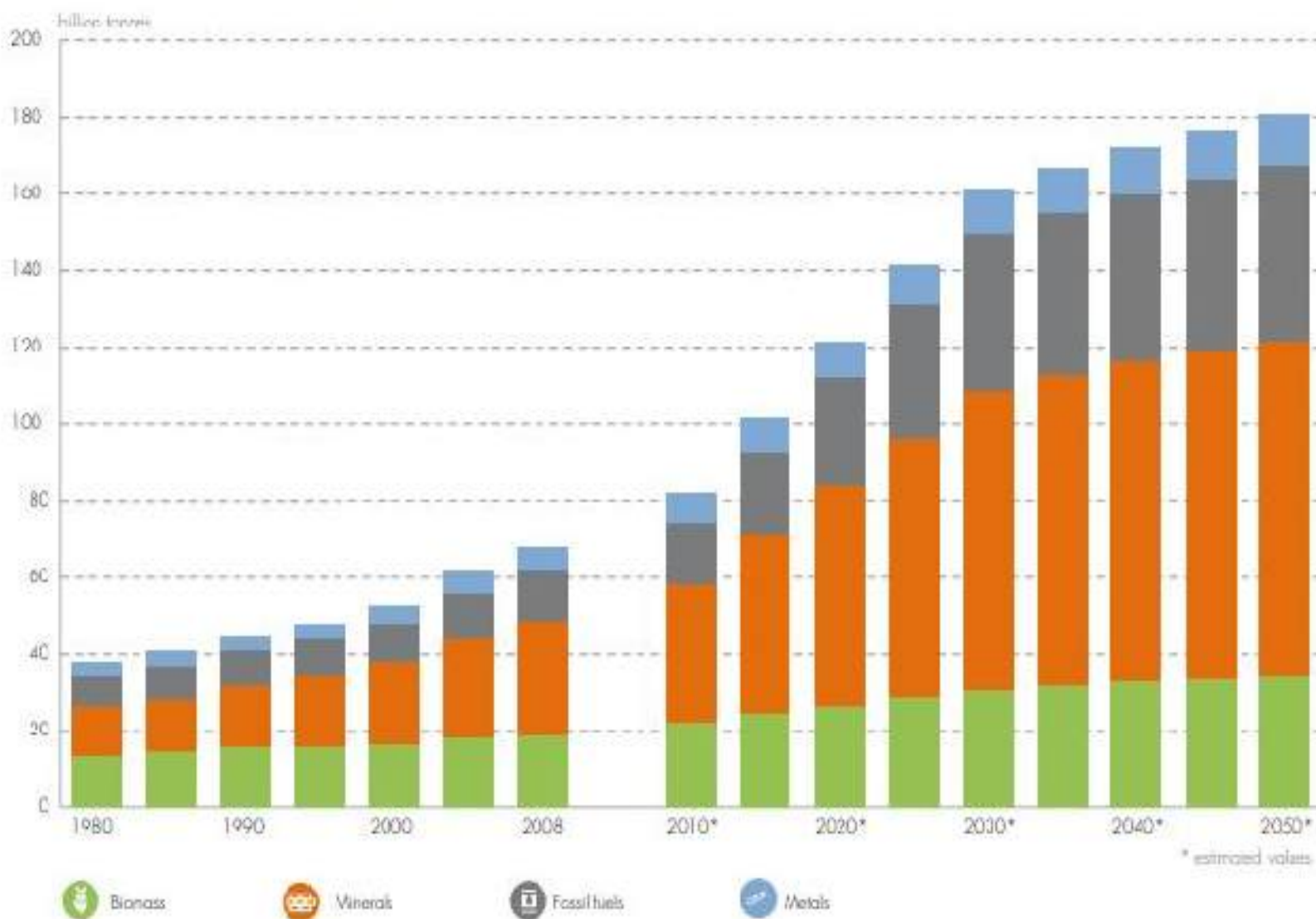
Embodied energy / materials impact:

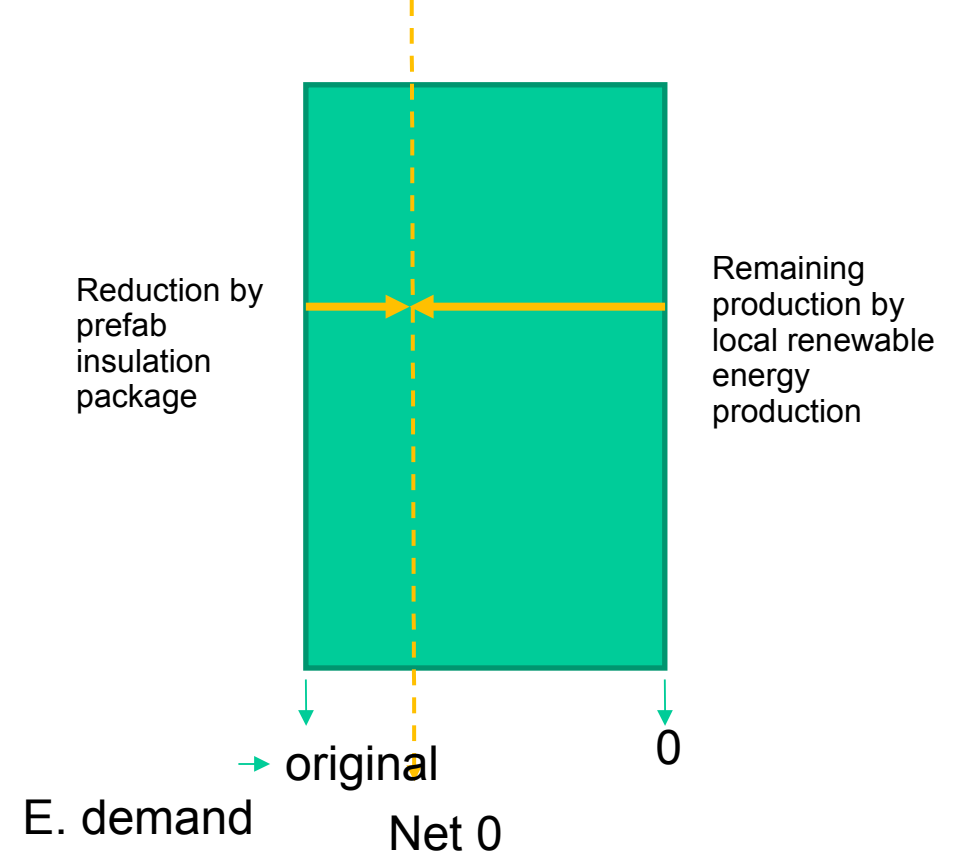
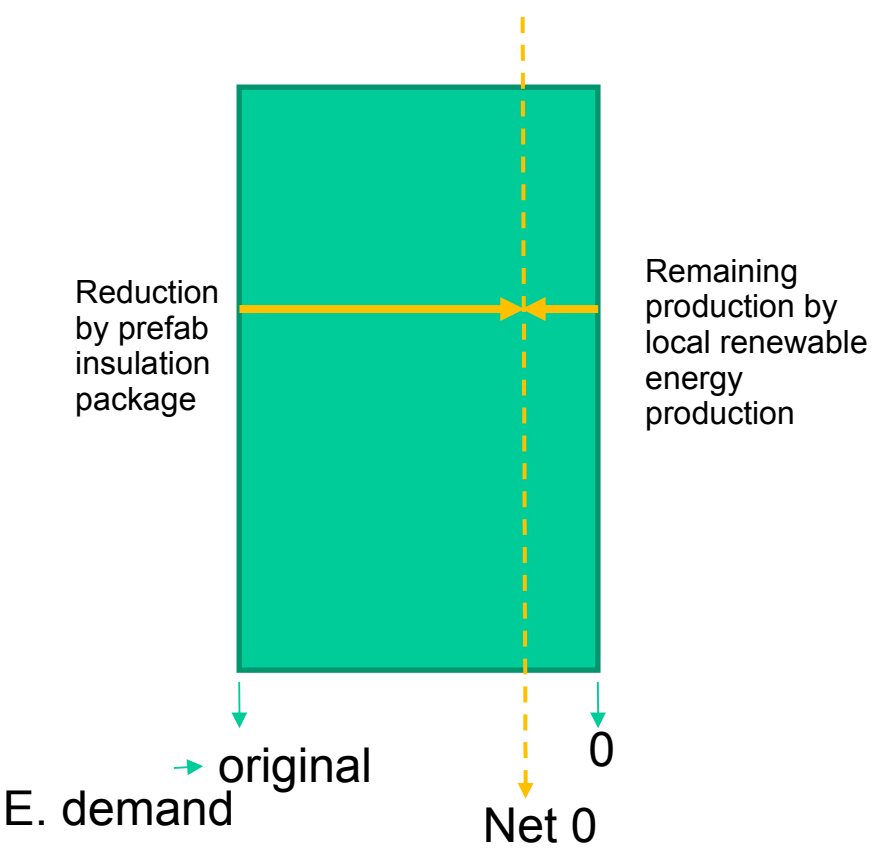
IEA annex 57

More Connect

Global material consumption

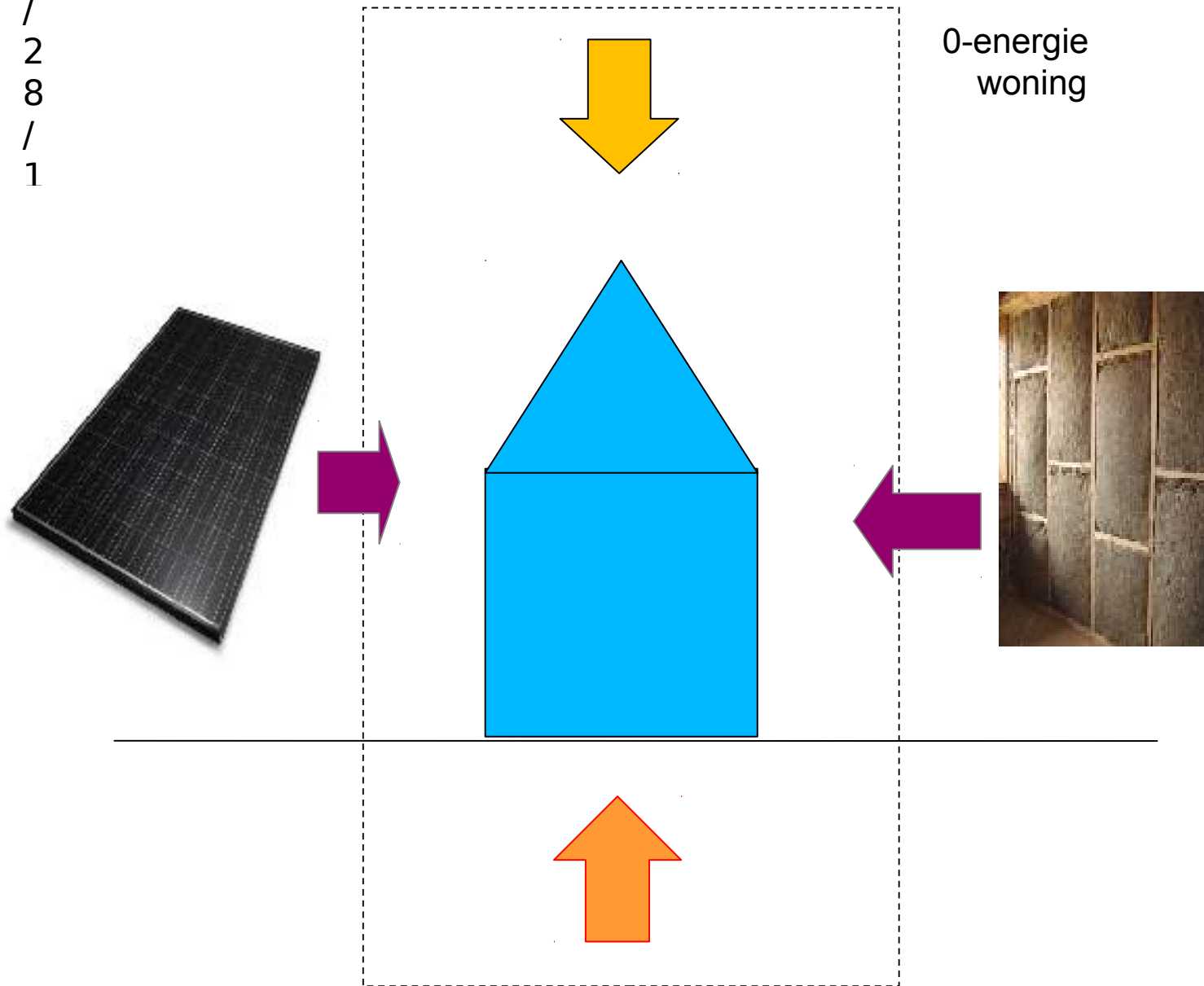
assuming catching up of all developing countries and OECD per capita levels from 2030 onwards





Net 0 is possible in many combinations

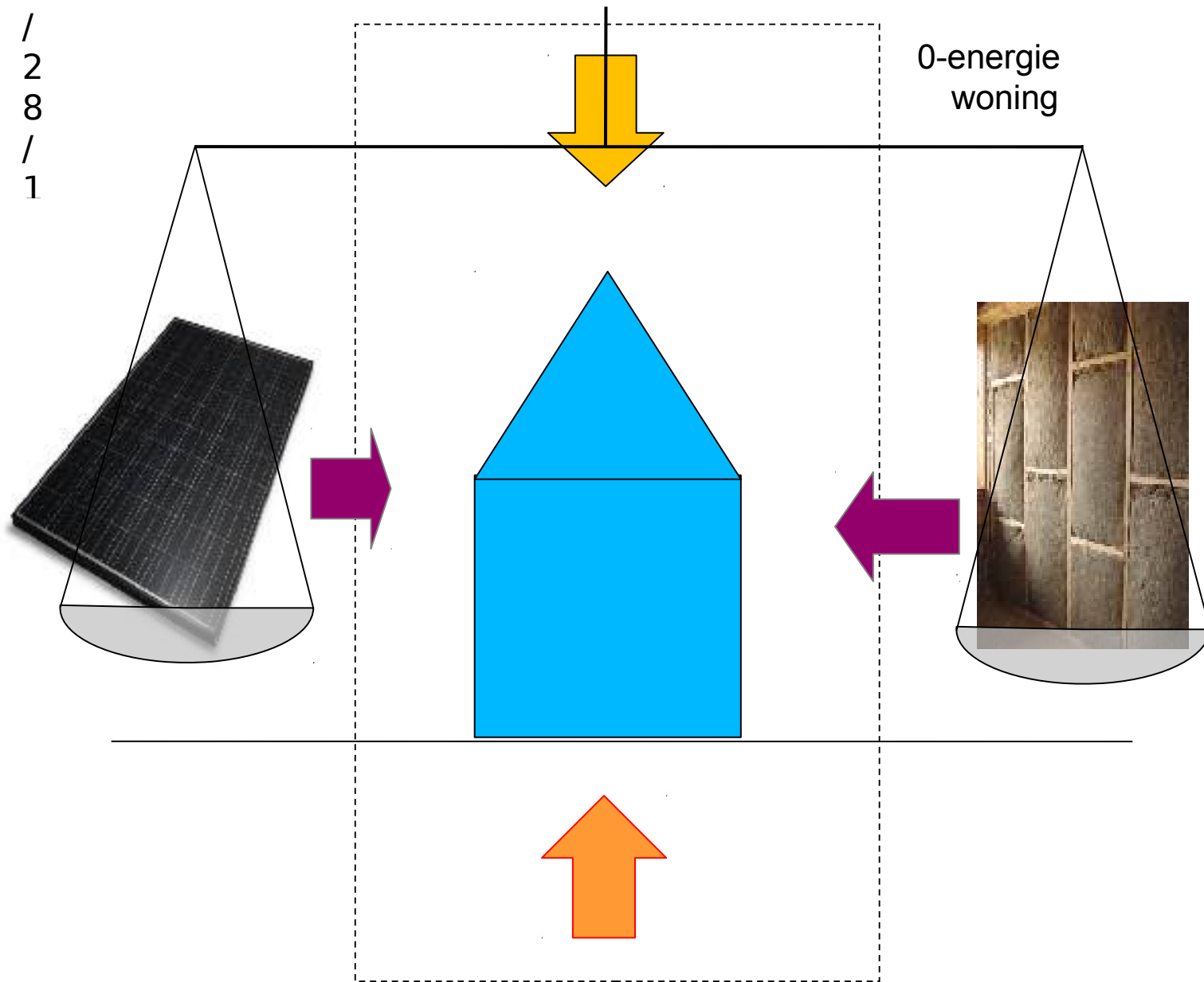
9
/
2
8
/
1



(operational) Energy is a Non issue: its only about material input for reduction and production.

(A PV panel is the impact, the energy is inclusive and free...)

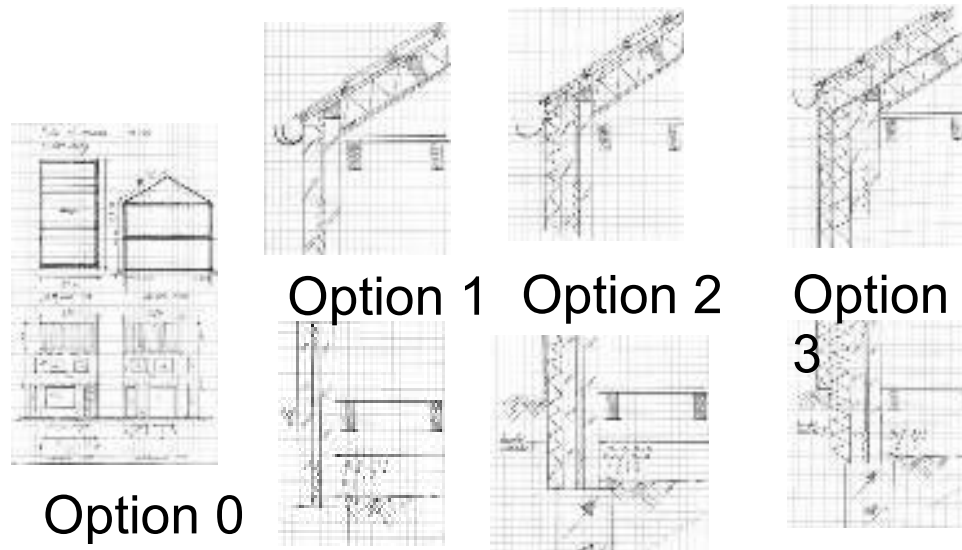
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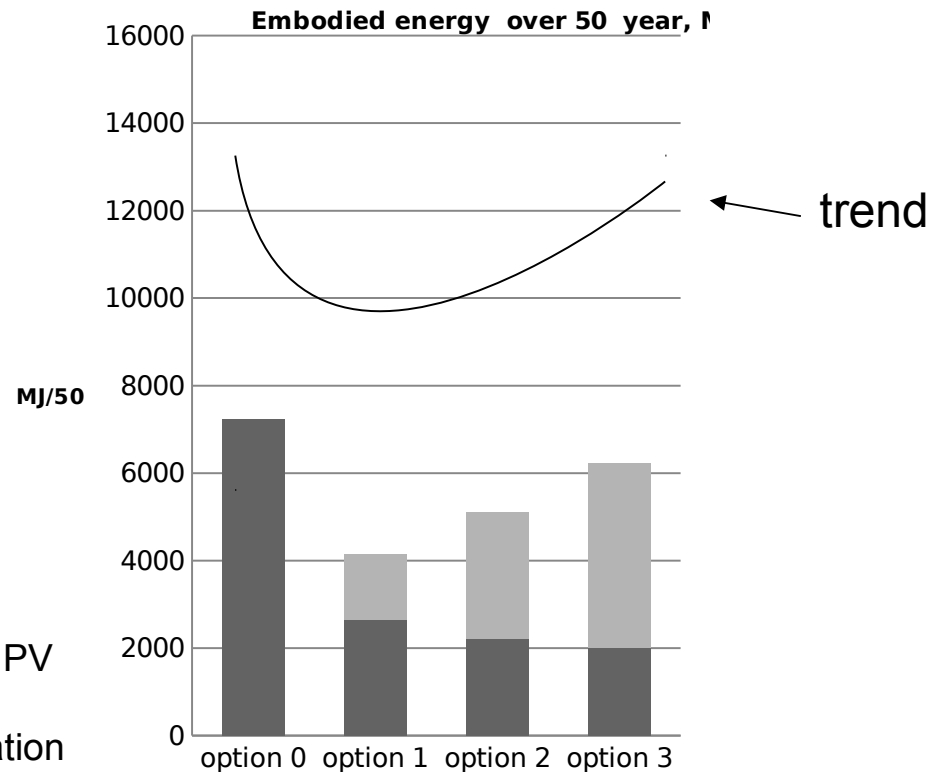
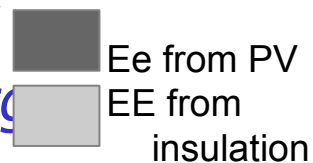
(A PV panel is the impact, the energy is inclusive and free...)

Renovating for 0-energy is a materials optimization question. Embodied energy from reduction and production combined, averaged over 50 years



All 4 options are 0-energy, the combined embodied energy differs per option and per kind (reduction or production)

Minimal overall embodied energy is for option 1





Biobased renovation:

Lower embodied energy/materials impact

Not only housing make overs, also reorganising service in society, district level approach, urban make over, other scale levels.



Tomorrow :
Start re-organising, Especially in an urban enviroment, not possible in a rural environment.



In het kort

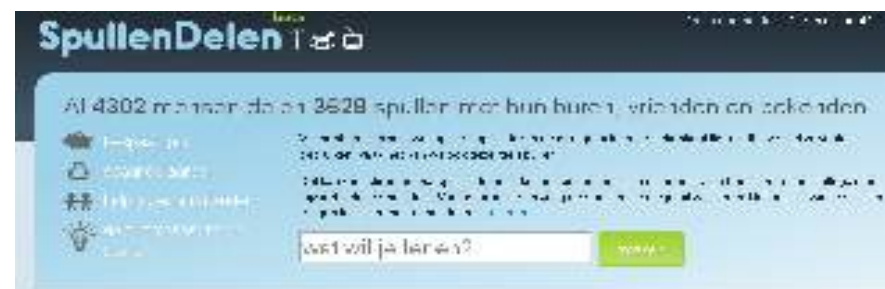
Thema's die worden behandeld

- De rol van de lokale overheid in de realisatie van de transitie naar een duurzame samenleving
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De rol van de lokale overheid





Vale Ouwelaan 132

3754 JH Gouda

€ 269.500 k.v. [Maand schen berekenen](#)

[Overzicht](#) [Omschrijving](#) [Kenmerken](#) [Foto's](#) [Maandlasten](#) [Kaart & route](#)

U bent vanochtend wakker en het is heerlijk zonnig. Het is u in de ochtend duidelijk dat u uw eigen huis wilt. Het is u niet alleen om de eigen woning van een zonnige plek te kopen, maar om een zonnige plek te kopen. Het is u niet alleen om de eigen woning van een zonnige plek te kopen, maar om een zonnige plek te kopen. Het is u niet alleen om de eigen woning van een zonnige plek te kopen, maar om een zonnige plek te kopen.

Kenmerken

Schouwingsduur	1 uur
Oppervlakte	25 m ² woonopp. / 75 m ² perceelopp.
Aantal kamers	Kamers (13 x 4 kamers)

Proviandruil wint eerste Foodchallenge2020

Wendy Kluis-Valsude Diphocris (zie foto) streeft naar de eerste winnaar van Foodchallenge2020. Zij won daarmee een foodtrip ter waarde van € 1.000. Het concept is gebaseerd op ruilhandel.

Er worden nu bijna 1000 mensen op zoek naar de eerste winnaar van Foodchallenge2020. Het concept is gebaseerd op ruilhandel. Het is u niet alleen om de eigen woning van een zonnige plek te kopen, maar om een zonnige plek te kopen. Het is u niet alleen om de eigen woning van een zonnige plek te kopen, maar om een zonnige plek te kopen.



10 Foodchallenge2020 - wint eerste prijs

Weggoien? Mooi niet!



Zoeken

[Thuisaanpak](#) [Nieuwsgediet](#) [Vrienden](#) [Café](#) [Forum](#)

[Home](#) [Bezoeken](#) [Starten](#) [Alle Repair Cafés](#) [Forum](#)



Bezoeken

Weggoien? Mooi niet!

Weggoien? Mooi niet!
 > op 02 met
 Daity
 > op 02 met
 Den Haag
 > op 02 met
 Rotterdam

Weggoien? Mooi niet!
 Toesjes en je je je



Thuisafgehaald

Makelt het delen van maaltijden makkelijk

Thuisafgehaald is een online platform dat het delen van maaltijden makkelijk maakt. Het is u niet alleen om de eigen woning van een zonnige plek te kopen, maar om een zonnige plek te kopen. Het is u niet alleen om de eigen woning van een zonnige plek te kopen, maar om een zonnige plek te kopen.

[Direct aanpak](#)

[Direct aanpak](#) [Direct aanpak](#) [Direct aanpak](#)



Weggoien? Mooi niet!

Vandaag af te halen

Maatschool met Isaac
 Maatschool met Isaac is een online platform dat het delen van maaltijden makkelijk maakt. Het is u niet alleen om de eigen woning van een zonnige plek te kopen, maar om een zonnige plek te kopen. Het is u niet alleen om de eigen woning van een zonnige plek te kopen, maar om een zonnige plek te kopen.

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Not a A+++ C2C laundry machine , but laundry shops , with pick up and return service .



0-energy Town

Gussing: ~ 4000 inhabitants



1992

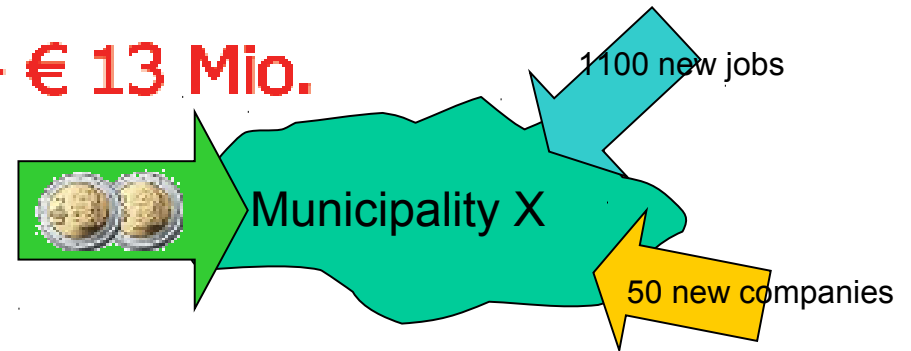
-

2007

€ 6,2 Mio.



+ € 13 Mio.



The Concept of 0

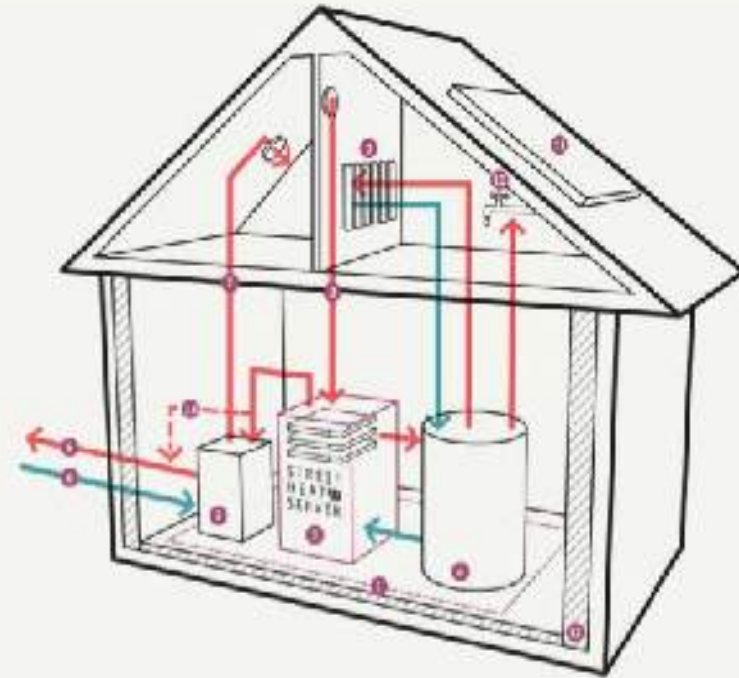


impressie wijk

Studying 0-impact, for energy, water, materials, food, on district level

decentral data centre's
Streif Germany

Sharing data centers:
sharing heat

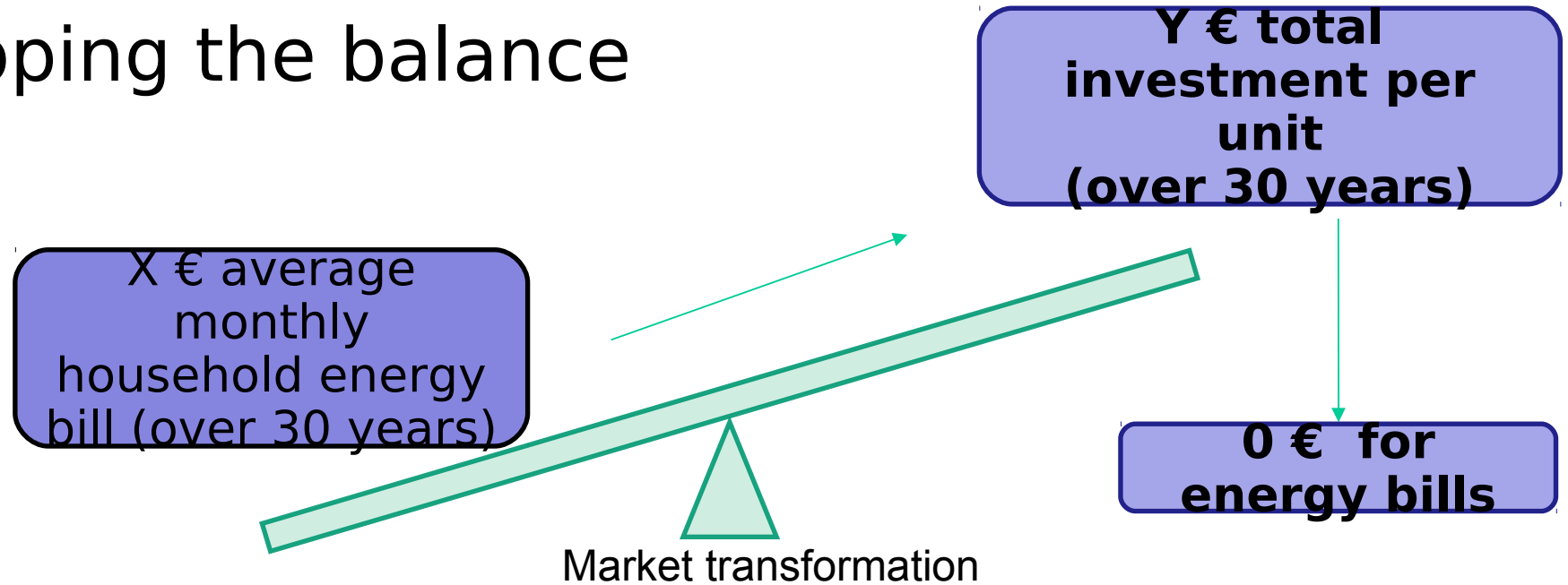


- 1 HEIZUNGSSYSTEM ZUR GEBÄUDEBEHEIZUNG, bestehend aus:
- 2 ABLUFT-WÄRMETAUSCHER
- 3 STREIF HEAT SERVER
- 4 PUFFERSPEICHER
- 5 FORTLUFT
- 6 FRESCHLUFT
- 7 ZULUFT

- 8 ABLUFT
- 9 HEIZUNG
- 10 WARMWASSER
- 11 PHOTOVOLTAIK (optional)
- 12 GEBÄUDE MIT WÄRMEGEDÄMMTER AUSSENHÜLLE
- 13 SOMMER-BYPASS

Irish approach, and Dutch support?

_tipping the balance



_turning energy expenditure into investment

Made feasible as the final product of energiesprong is net zero on the meter, e.g. through a combination of improved energy performance (i.e. energy savings) and on-site generation zero energy bills are achieved which are supported by an energy performance guarantee by the construction company / supply chain.

_E=0 project opportunity

Advance the mass market introduction of net zero energy buildings through market transformation.

Needs revenue funding to resource independent team (energiesprong Ireland) to redirect and support activities of relevant stakeholders to make this mass market introduction feasible.

Dutch parties interested .

_feasibility assessments

To broker a Irish deal similar to Dutch approach:

Financial feasibility

Supply chain integration and cost optimisation

Revenue model and energy market integration

Planning framework

Archetypes and first test volumes

Scalability across Irish market

_milestones from feasibility work

Proof that technical solution is deliverable in Ireland


Confidence that solutions can be implemented within existing energy regulation

Confidence that solutions are compliant with local planning control (in chosen locations)

Adaptation of Dutch financial model to Irish market (?)

Early market response to energiesprong concept

Tabel 3 Transition in progress

Activity	old carrier	 new carrier	consequence	footprint?
Games	boardgames	computer		
Music	LP/CD	digital forms	stage perf.	
Movies	videotape/CD	online tubes	theater	
Goods	shopping streets/malls	webshops		distribution
News	newspapers	web/blogs	.	
Journals	print subscription	opensource	.	
Hospitality	hotels	private roomrent		
Transport	taxi	private car	.	
Mealservice	restaurant	take away/private		
Furnishing	solids to "ikea"	to 2nd hand (21 ste eeuw)		
Flying	travel agencies	hop and go		
r.rovers 2015				
Building house	on site constr/labor investment	prefab/CAM	commodity (21 ste eeuw)(roof window, facades, whole house)	
Maintanance	hired	Resco's : Renovation service corporations		
Electricity	grid controlled	on site prod./decentral		
datacentres	heating units ?	sharing heat		



Tiwos Tilbury
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Research Institute Built Environment of Tomorrow

Lets renovate!

Thank you for listening

Ronald Rovers,
Director SBS consultancy
Professor (sustainable) Built Environment



Sustainable Building Support and consultancy,

www.sustainablebuilding.eu @ron_rovers