FIX
ENERGY FINANCING MIX

Creating an Innovative Financing Mix for Energy Efficiency

Andreas Karner

Brussels, 19.02.2020

CON PLUS ULTRA

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Current challenges for Energy Efficiency

- **Lack of (private) investments** in EE improvements
- Still challenges ahead to i**mprove EE above minimal legal requirements**
- **Significant share of old, energy inefficient technology** in building, public infrastructure and businesses
- **Delay in implementation of EE investments**, especially in private sector because of
  - long payback times
  - lack of financing means
- **Lack of knowledge/experience** using innovative financing mechanisms

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Aim of E-FIX HORIZON2020 project

- To increase the use of innovative financing mechanisms in energy sector so that investments in energy projects and services raise in the long-term

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E-FIX wants to remove barriers between investors and project developers

Investors in energy projects

- Commercial banks
- Development banks
- Investment funds
- ESCOs (using internal funds)
- Microfinancing institutes
- Business Angles
- Communities
- Private citizens - the crowd
- Carbon or Climate Funds

Barriers

Perceived risks of the energy projects

- Uncertainty for investor
- No capacity to plan and implement

Restricted access to funds

- Missing collaterals
- Excessive regulations for energy projects

E-FIX

building bridges for energy investments

- Missing know-how for feasibility assessment
- Perceived unfeasibility/ long payback time
- Lack of public acceptance
- Administrative barriers for the use of innovative financing mechanisms
- Legal uncertainty regarding security of investment

Project developers and owners

- Businesses of tertiary sector
- Industry
- SMEs
- Start-ups
- R&D
- Communities
- Citizens
- ESCOs (3rd party financing)

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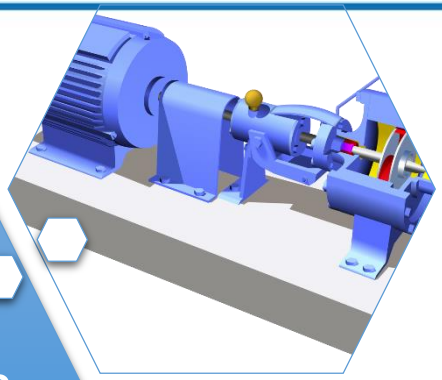
Innovative financing mechanisms

- **E-FIX** aims at triggering **private finance for sustainable energy projects** by focussing on **specific financing mechanisms**



Energy performance contracting

Equipment Leasing

Crowdfunding /-investing

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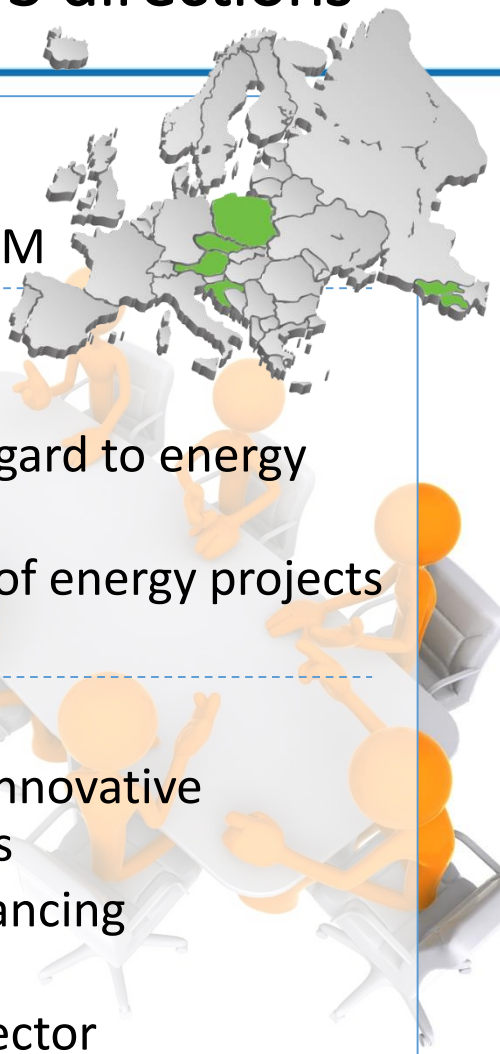
E-FIX is moving along 3 directions



1

TRANSFER KNOWLEDGE

- Within the Project Partnership: AT, CZ, HR, PL, GE, AM

2

BUILD CAPACITIES

- Increasing the competencies of market actors, in regard to energy and financing requirements
- Training of „Ambassadors“ for innovative financing of energy projects

3

ROLL OUT

- Strengthening national/regional structures for the innovative financing of energy projects in the partner countries
- Test and disseminate tailored innovative energy financing mechanisms
- Thereby increasing the investments in the energy sector

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Addressing common barriers

Perceived risks and uncertainties for energy projects

- Bankability for investor
- Lack capacity to plan and implement
- Missing know- how for feasibility assessment
- Perceived unfeasibility/ long pay back time
- Lack of public acceptance

Provide both – energy project implementers and investors – with an **accurate assessment of the feasibility** of the projects, addressing the common risks of uncertainty of returns and perceived unfeasibility

Restricted access to funds

- Missing collaterals
- Excessive regulations for energy projects
- Administrative barriers for the use of innovative financing mechanisms
- Legal uncertainty regarding security of investments

Knowledge transfer focused on **3 types of innovative financing mechanisms, building capacities** in the partner countries for further strategic development as well as dissemination

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Already available results

- **Financing & Energy Policy Baseline** for each partner country
- **Case study analysis** of alternative financing of energy projects in each partner country
- **Individual gap analyses** for validating the preselection of the innovative financing mechanism
- **Training materials** in local languages
- **Catalogue of evaluation methods** for the systematic assessment of sustainable energy projects
- Individual plans for the **roll-out of pilot financing mechanisms**

All reports available on the E-FIX webpage:
www.energyfinancing.eu

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Multi-Stakeholder Engagement is a Key

E-FIX Ambassador's roles

- Ambassadors are acting as multipliers for the E-FIX approach
- Participation at **energy financing trainings**
- Support in **pilot project implementation**
- Involvement in Strategy and Toolbox development
- Possible involvement in the development of **national competence centers for energy financing**
- International networking opportunities via the Ambassador platform

- **E-FIX Ambassador Platform online at** www.energyfinancing.eu

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Knowledge transfer process WITHIN partnership

Pairing expert partners with “novices” using mix of instruments:

Basic	• Internal **train-the-trainer seminar** to provide common basis
Advanced	• Bilateral **Master Classes** • Focused on successful implementation of local pilots
Practical	• **Pilot financing campaigns** in each partner country • **Stakeholder events & Study Visits**
Focused	• Working in **focus groups** according to financing mechanism across all WP activities

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Pilot campaigns

- involvement of relevant stakeholders (project owners, energy providers, finance institutes, ESCOs, community and interest groups…)
- test and implementation of the E-FIX methodology in real-life environments, in each of the six partner countries
- focus mainly on energy efficiency and partly on renewable energy projects
- Realisation of pilot financing campaigns envisaged by end 2020/early 2021

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What E-FIX aims for

- **European-scale VISION** – Definition of long-term and transnational goals for successful and accelerated financing of energy project until 2030
- **Integrate stakeholder opinions** and objectives
  - transnational and country-specific issues for promoting innovative financing
  - political, legal/regulatory implications
- **Develop one Roadmap** considering the EU 2030 climate and energy framework targets
- Describe specific actions --> connect with local **E-FIX Action Plans**

Objective: ***Illustrate EU-wide development of energy financing environment and implementation.***

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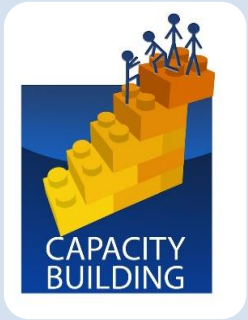
E-FIX. Expected Impacts



1 E-FIX Roadmap
6 Action Plans

120 E-FIX ambassadors

Pilot financing campaigns, investment ~ 8 mill. EUR

6 Energy Financing competence centers

Energy savings triggered ~ 19 GWh/yr

Renewable energy triggered ~ 1.6 GWh/yr

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THANK YOU!

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Pilot financing campaigns - Armenia

Energy Efficiency in Armenia – Economic aspects

Challenges

- More than 70% of primary energy is imported, high dependence on gas and nuclear fuel imported from Russia
- Supply gap: demand is growing, however, the majority of generating assets are more than 25 years old
- Energy prices are growing in the last decade: electricity by >110%, gas by >220%

Opportunities

- Stable growing economy – 7.5% GDP Growth 2019, 6-6.5% forecast for 2020-2021
- Economy diversification – manufacturing, construction, services are outperforming
- Access to the markets – Armenia is a member of Eurasian Economic Union and has preferential trade regimes with EU and US

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EE financing in Armenia

Armenia has a significant potential for EE in all sectors of economy, including:

- Agriculture
- Manufacturing
- Transport
- Construction
- Residential

Main challenges:

- Lack of dedicated financial mechanisms
- High interest rates and short maturities of loans, banks usually ignore savings in the valuation of the cash flows of the projects
- Lack of local technical capacity, including EPC consultants and experts

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GREENLEASING

ACBA LEASING ԱԿԲԱ ԼԻԶԻՆԳ

Leasing with
50 % down payment

Without any financial analysis

Without any additional pledge

Green Leasing prioritizes EE and RES

Grand Sport, a sports and wellness centre, rose to a new level of efficiency by investing in high-performance water heating solar technologies. partner Shtigen company
Investment size
US$ 384,000

Apaga Resort build the biggest solar power station in Tavush region, Yenokavan village.
Investment size
US$ 96,500

2019 - Year of new green projects

1MW power solar station build by Baghramyan Shin in Shenik region, Armavir, partner Shtigen company
Investment size
US$ 312,000

Janaparh LLC invested in energy efficient technology to organize its activity more effectively.
Investment size
US$ 340,000

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Ongoing energy efficiency projects

ACBA Leasing contributes
to energy saving of 15,000 MWh/a
in financing production lines in
Armenian economy

Investor
Shin Plus Ltd

Investment
Road paving roller

Investment size
US$ 89,000

Financial results
Payback in 5 years

Energy savings
196 MWh/year (-28%)

CO2 savings
55 tonnes/year (-44%)

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How E-FIX helps to overcome the challenges

- **Support the development and roll-out of new innovative financing mechanisms** leveraging on **ACBA's Green Leasing** experience
- Delivery of **dedicated training courses on EE leasing, EPC, crowdfunding**, delivered through **bilateral master classes (cross-country approach)**
- Continuous workshops and **training opportunities** for local experts, consultants, suppliers, vendors and potential clients
- **Ambassador platform**: creation of the pool experts, who will support to promote the new financial mechanisms and enhance local capacity to implements EE projects.
- **Who are the Ambassadors**: experts from the different sectors and agencies, including government, business community, financing sector, consultants, vendors and educational experts.

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EE focus areas - Armenia

ACBA Leasing identified the following sectors for the promotion of the new mechanism:

- **Construction** – replacement of old equipment, including excavators, tractors, heavy machinery etc.
- **Transport** – promotion of electric vehicles
- **SMEs** – EE equipment for small scale bakeries, warehouses etc.

Current project pipeline includes more than 15 sub-projects which will secure >600k USD of investment and annually 20 GWh of primary energy savings

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THANK YOU!

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PROSPECT

Peer Powered Cities and Regions

Peer learning for Innovative financing

Overview of the PROSPECT project

Dr. Vlasios Oikonomou

Institute for European Energy and Climate Policy, Amsterdam, the Netherlands

IEECP

INSTITUTE FOR EUROPEAN ENERGY AND CLIMATE POLICY

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 752126.

1. About PROSPECT | who we are

Key questions:

- How can public authorities **carry out simple energy interventions** to secure investments for joint sustainable initiatives?
- What can public authorities **learn from successful and less successful projects and initiatives** and about planning and design phase to accessing funds, developing financing schemes or better access to finance?

Info:

- Horizon 2020 RIA June 2017 – May 2020, Contract number: H2020-EE-09-2016-2017/752126
- **Legal coordinator: Institute for Housing and Urban Development Studies BV – IHS**
- Scientific coordinator: Institute for European Energy and Climate Policy Stichting – IEECP
- 8 other partners, from total 8 countries

PROSPECT in a nutshell

PROSPECT

Develop and execute a complete peer to peer learning programme

- 5 annual peer to peer learning modules planned and delivered
- 50-60 single or multi-peer self-assessment per year
- Accreditation scheme developed and applied for new peers in each learning module

Create effective and productive peer to peer groups

- Matching of 5 peer to peer Module groups with 10-15 members per year
- Participation of minimum required number (10) of peers per Module
- 3 site visits from peers per Module per year

Build partnerships

- Paired engagements per module per year could lead to at least 20% rate of building partnerships within the learning programme Online networking within and outside the city/regions networks through online activities and web-platform could lead to 20% rate of online partnerships

Identify and set up proper replication mechanism

- Number of national peer networks
- 20% rate of Replication of learning programme from individual participants to their organizations
- 20% rate of Replication of learning programme from participants to other local or regional authorities in the same country of participating organizations

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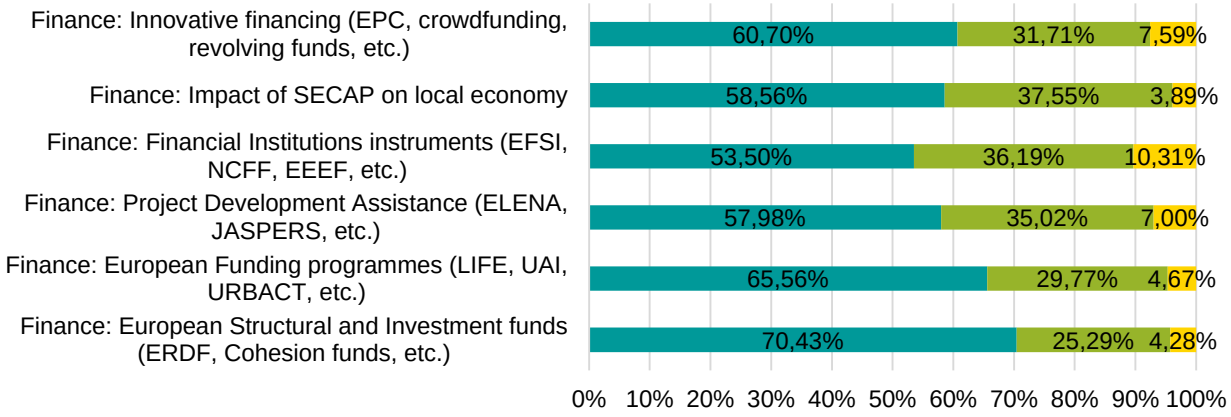
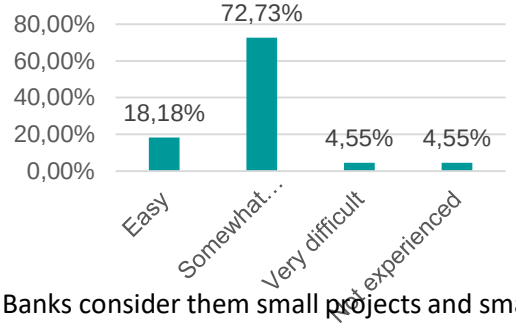
Needs faced on public buildings

Municipalities' needs in capacity building: financing



PROSPECT

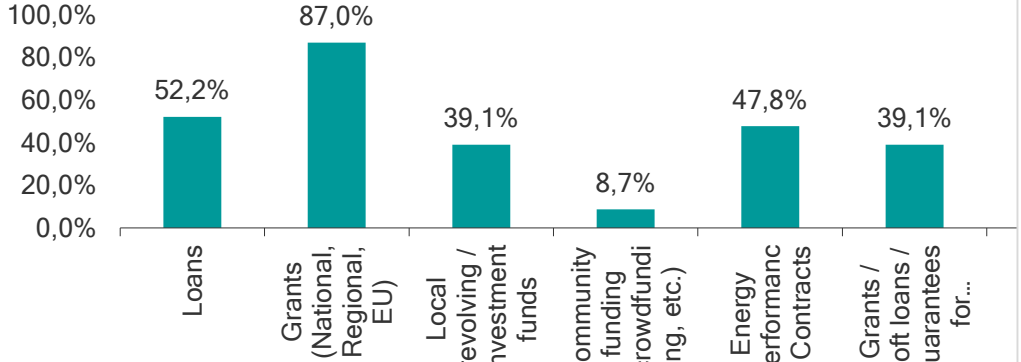
Difficulty of investment in public buildings projects



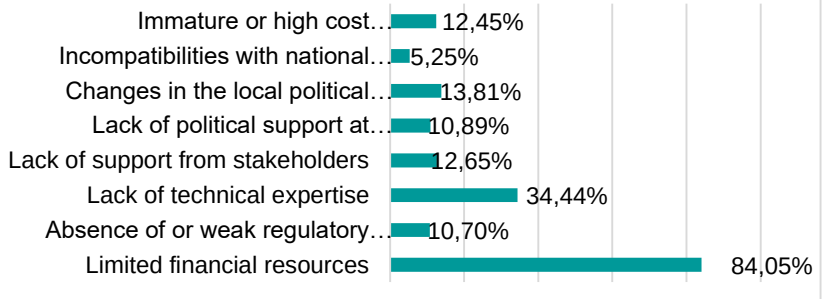
Banks consider them small projects and small scalability or bundling available – High upfront technology costs

Legal barriers matching budget with investment cycles

Type of financing mechanisms you have experience with for funding sustainable energy projects?



Main barriers faced by municipalities



Types of projects for public buildings with innovative financing

Action	CO2-saving potential	Estimated costs for municipality	Cost-benefit ratio	Implemen-tation time frame	Target group	Key actors
Energy management for municipal buildings	Medium	Savings above expenses	Very high	2-3 years	Municipality	Municipality, External experts
Energy saving contracting	High	Very little to none or negative cost	High	1 year, contract will last for 7-20 years	Municipality	Municipality and ESCO (contractor)
Improvement of municipal indoor lighting	High	Medium	High	1 month	Municipality	Municipality and ESCOs specialising in lighting
Energy check for municipal buildings	Medium	1000 euros (average per building)	High	1 month	Municipality	Municipality, Energy expert
Building standards in new construction of municipal buildings	Medium	About 10-15% higher than conventional buildings	Medium	1-2 years	Municipality	Municipality, External experts
Building standards in refurbishment of municipal buildings	Medium	About 10-15% higher than conventional buildings	Medium	1-2 years	Municipality	Municipality, External experts
Implementation of renewable energy sources at municipal buildings	Medium	<10 cents /kWh	Medium	3 months	Municipality	Municipality, External experts

Adapted from the SEAP ALPS Project

Learning Program Steps

Step 1 : Getting Started
Online Orientation Session

Step 2 : Working Together
Online Learning Plan Development & Peer Learning Activities

Step 3 : Meeting Up
Physical Visit and Peer Learning Activities

Step 4 : Moving Forward
Online Transferability Assessment & Evaluation - Feedback

- Modules handbook
- Basic content prepared by PROPECT about the main innovative financing schemes under each module.

Results of four learning cycles

100 + cities involved

50 learning groups

- Main interest is for EPC, but more and more interest in citizen financing
- A lot of projects in public lighting and buildings
- A lot of interest, but not a lot of examples in transport

How to join the Learning programme

- For people working in European cities, municipalities, regions or their agencies
- Either join as mentor or mentee
- Choose among the five modules:
  - Public buildings
  - Street lighting
  - Private buildings
  - Transport
  - Cross-sectoral

- Visit www.h2020prospect.eu and learn more!
- Follow us: #h2020prospect

PROSPECT

Peer Powered Cities and Regions

Thank you!

Vlasios Oikonomou

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PALET

Energy Transition in the CityRegion Parkstad

Hans van der Logt
Energy Transition Manager

Gemeente **Heerlen**

Heerlen

Zonnekaart HRE-ketels *Limburgse energiesubsidie*

Omschakelen BANS Intereg Mijnwater

IEE ECOLISH energieboxen SLOK

VNG alliantie Dag van de duurzaamheid

IEE ENGAGE energieteams

Duurzaam Comfort voor huis en tuin

Citroën ZERO Sarah's wereld LED - OV

Bespaar en Verdien MVO prijs Parkstad

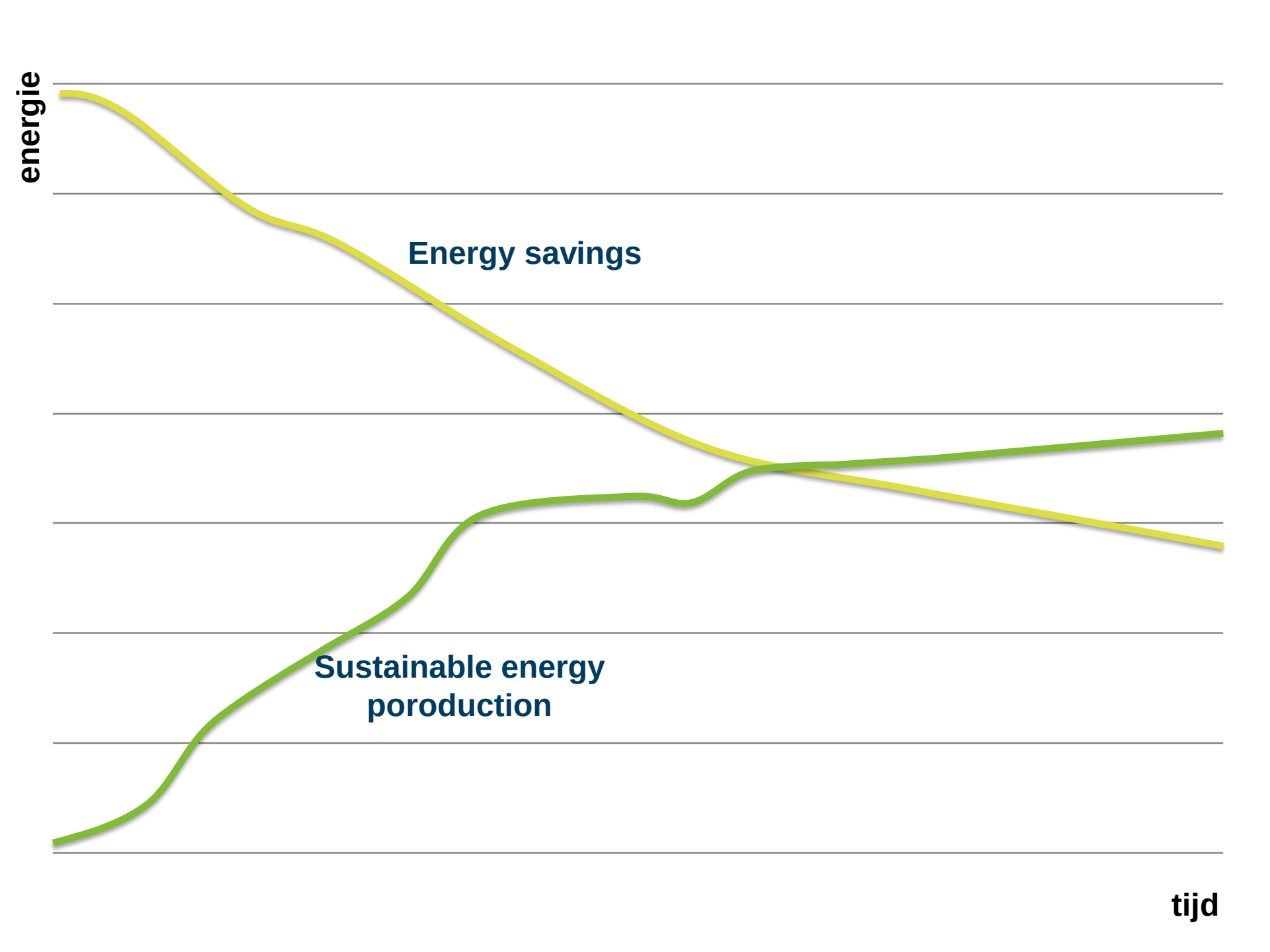
Intereg SUN Energielandschappen Energy Hills

Van oude naar nieuwe energie Wijk van Morgen

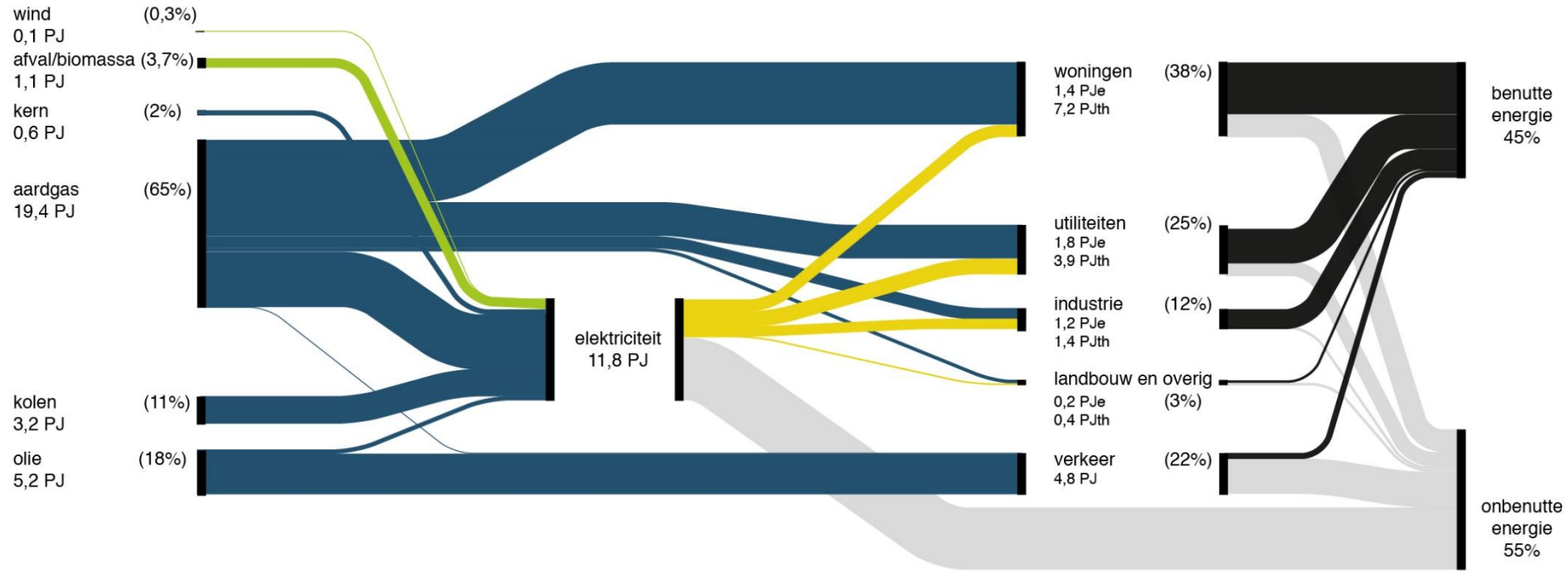
parkstad stadsregio limburg

Parkstad Limburg EnergieTransitie (PALET)

- GR: official legal cooperation on energy issues
- From spatial research to 8 studies and 8 action plans.
- Ambition: in 6 steps towards an energy neutral region in 20-40


energie
Energy savings
Sustainable energy
poroduction
tijd

2011 Parkstad *Huidige energiemix (29,6 PJ)*



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29,6 $PJ_{primair}$

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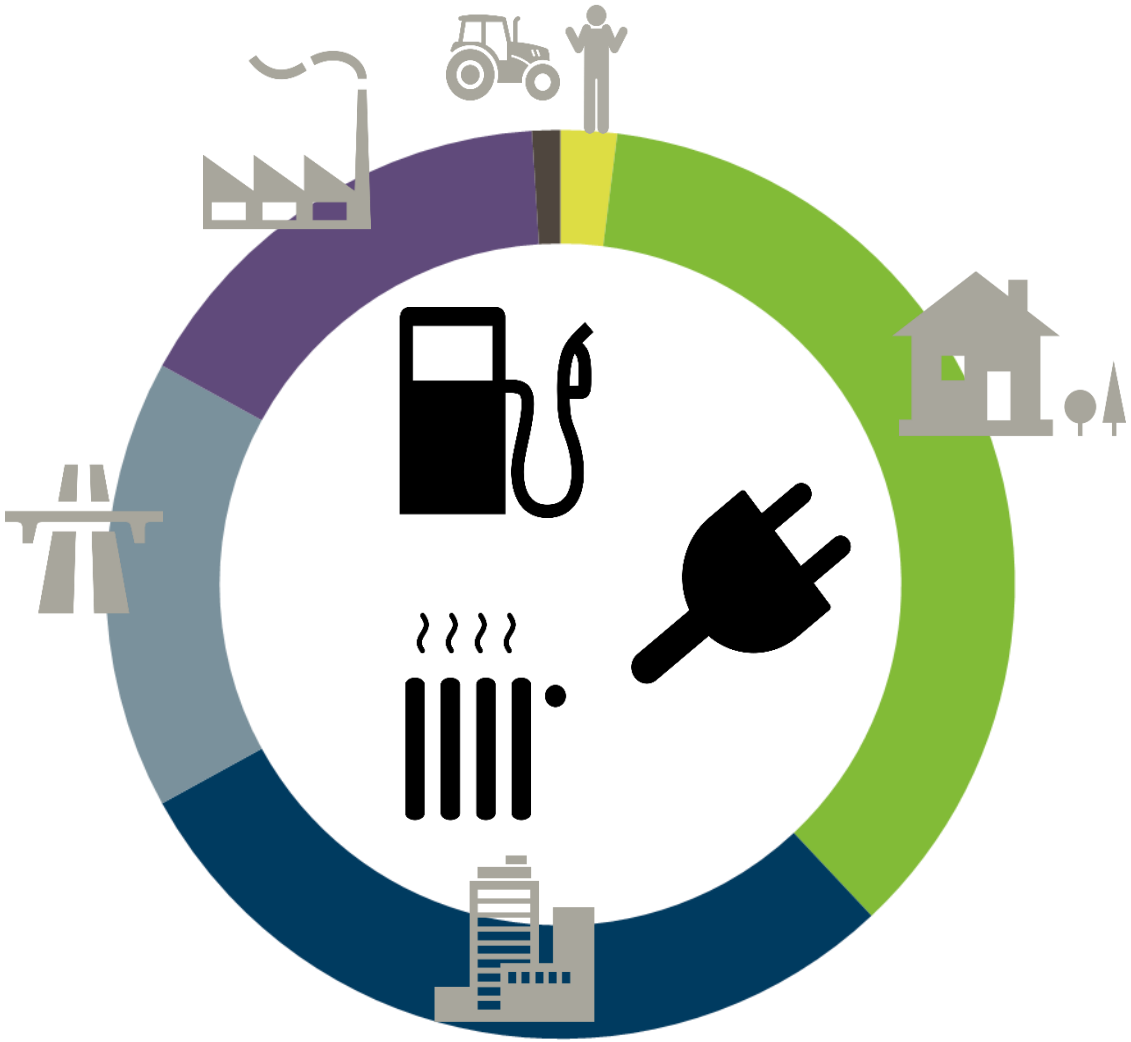
22,4 PJ



37% Woningen

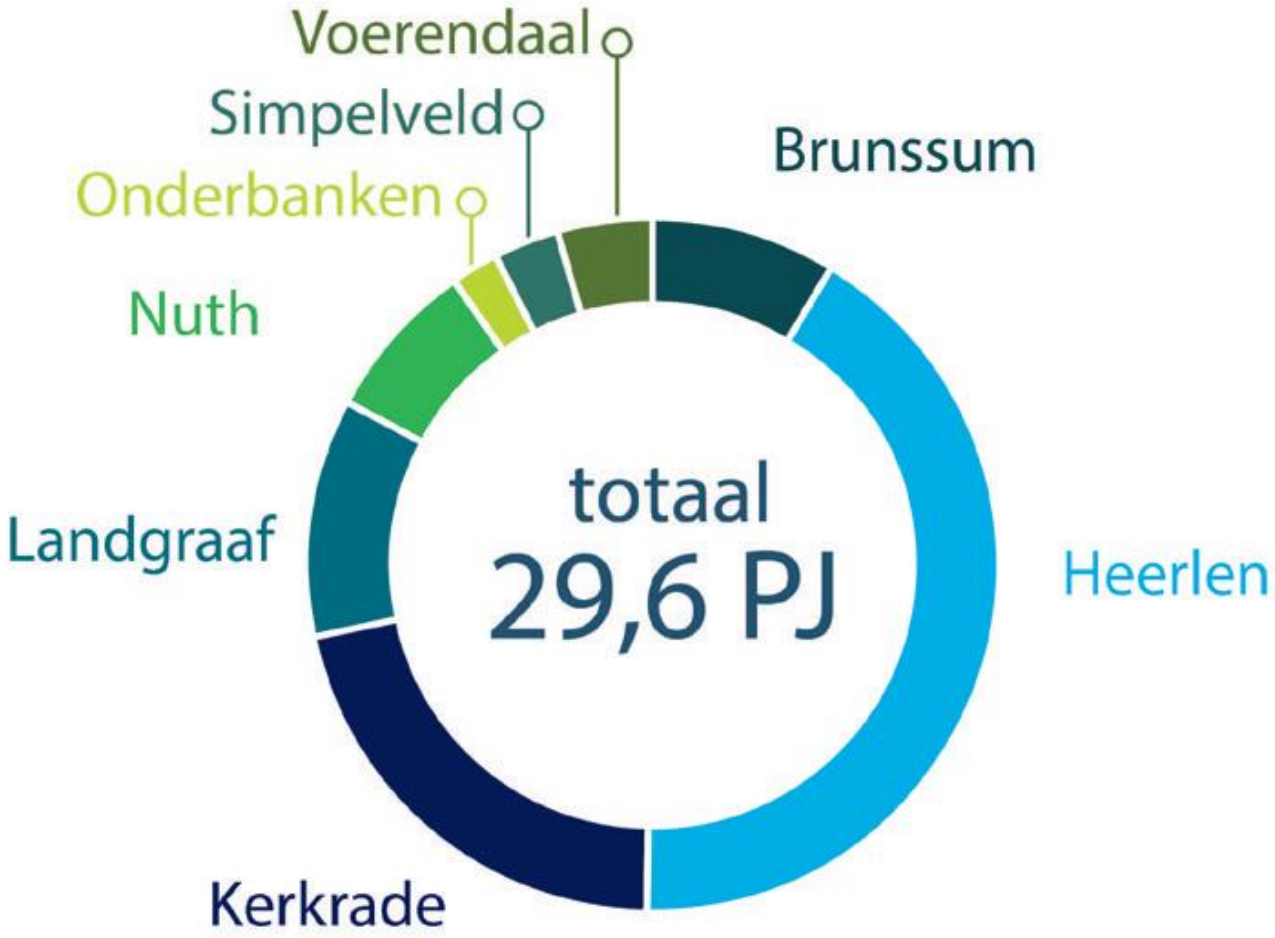
29% Publieke & Commerciële Dienstverlening

16% Verkeer en vervoer

16% Industrie en energie

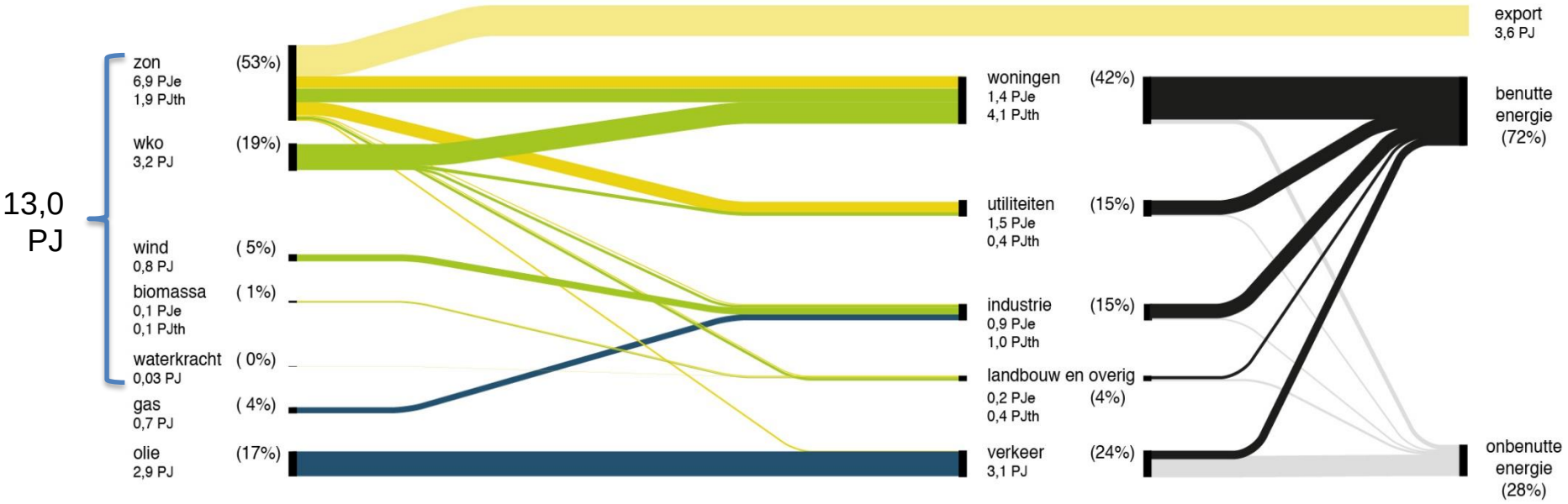
<1% Landbouw

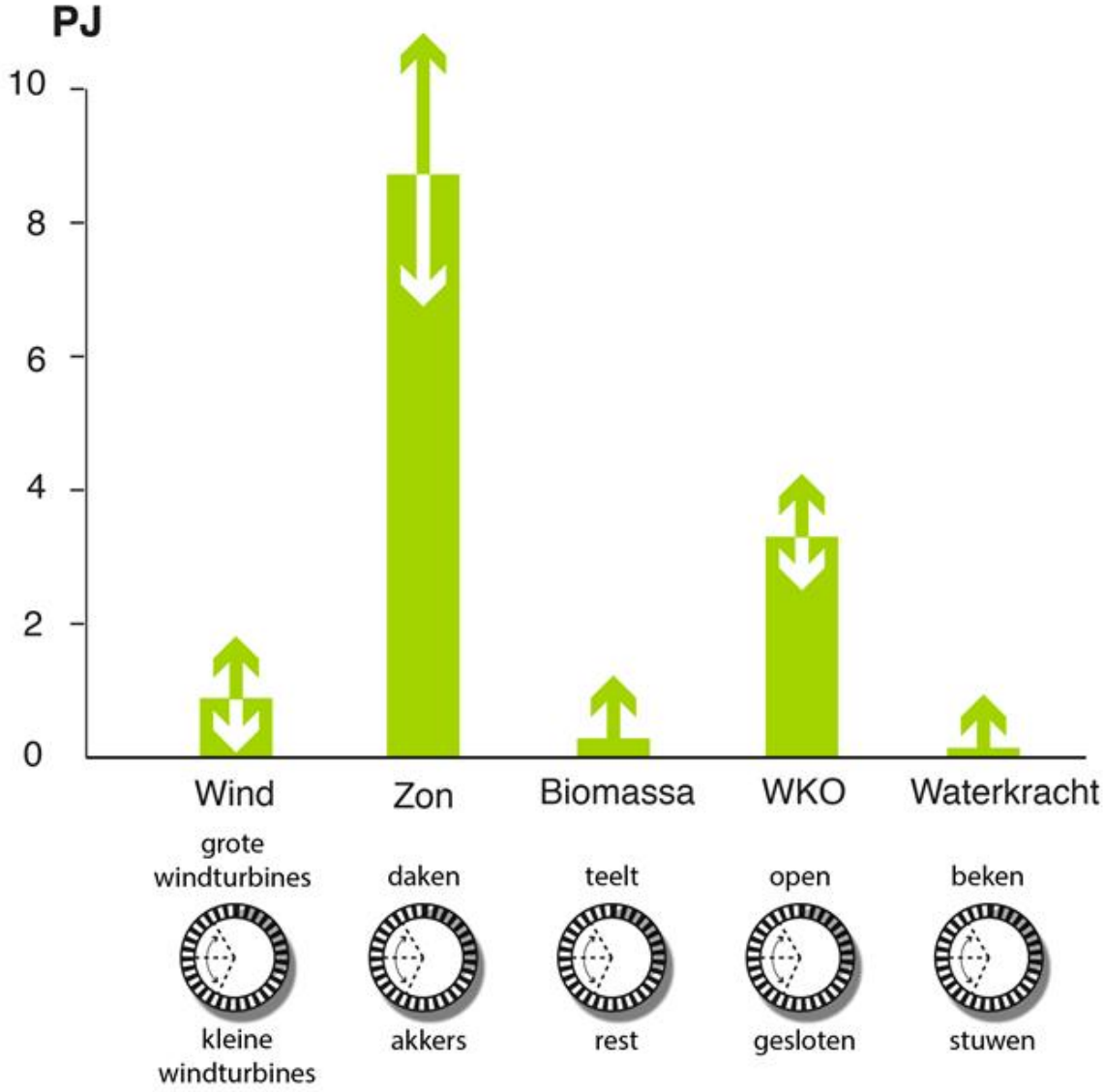
<2% Overig


Voerendaal
Simpelveld
Onderbanken
Nuth
Landgraaf
Kerkrade
Brunssum
Heerlen
totaal
29,6 PJ


€ 500 miljoen
+

2040 Parkstad *Voorbeeld van een mogelijke energiemix*




PJ
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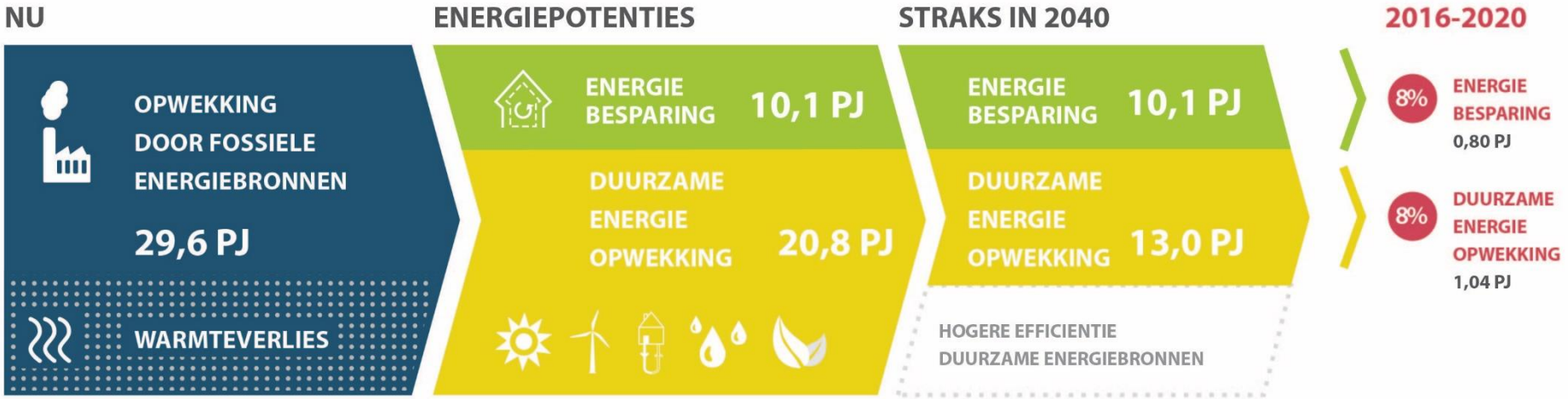
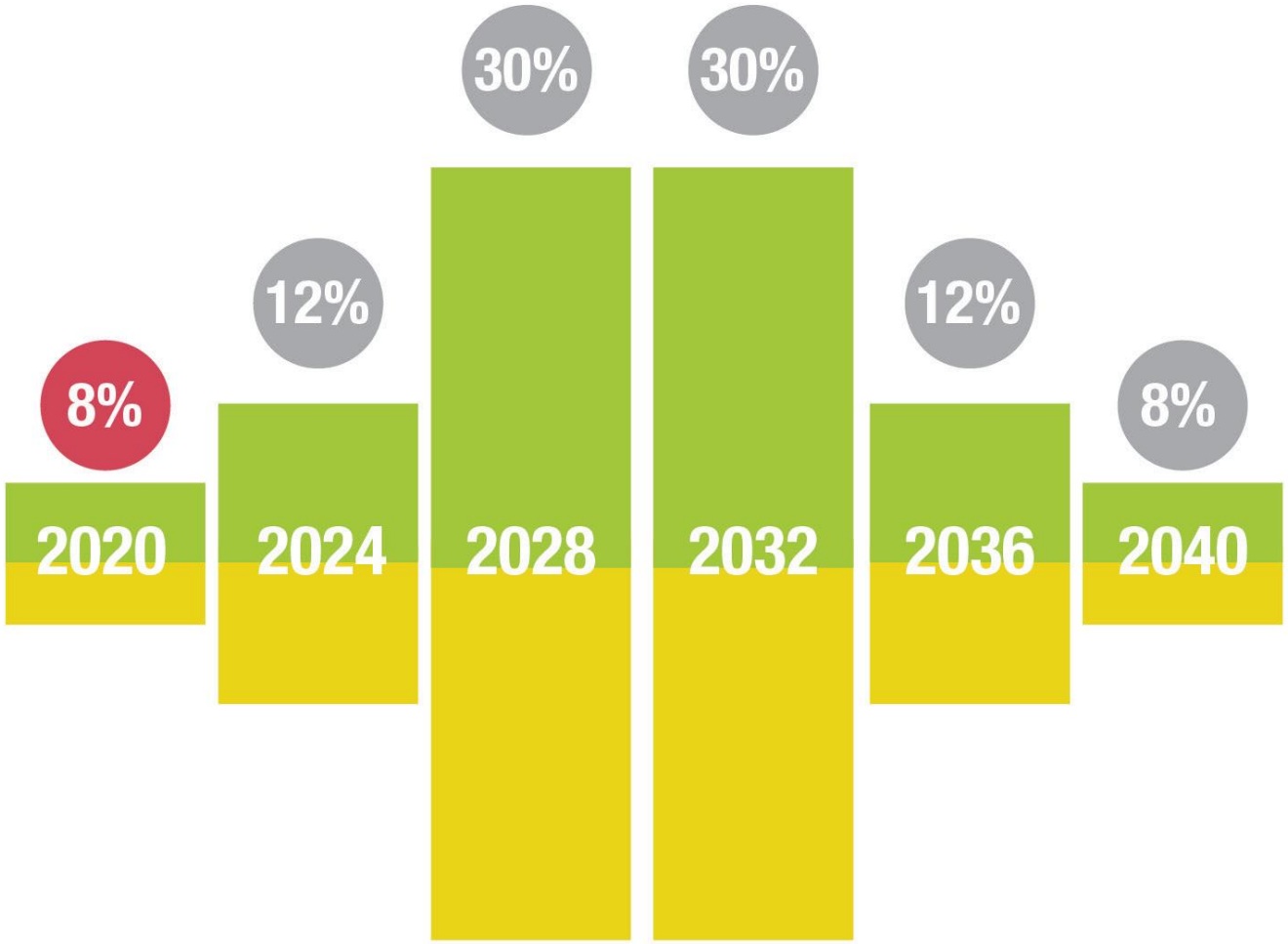
Waterkracht
grote windturbines
daken
teelt
open
beken
kleine windturbines
akkers
rest
gesloten
stuwen

PALET 1.0

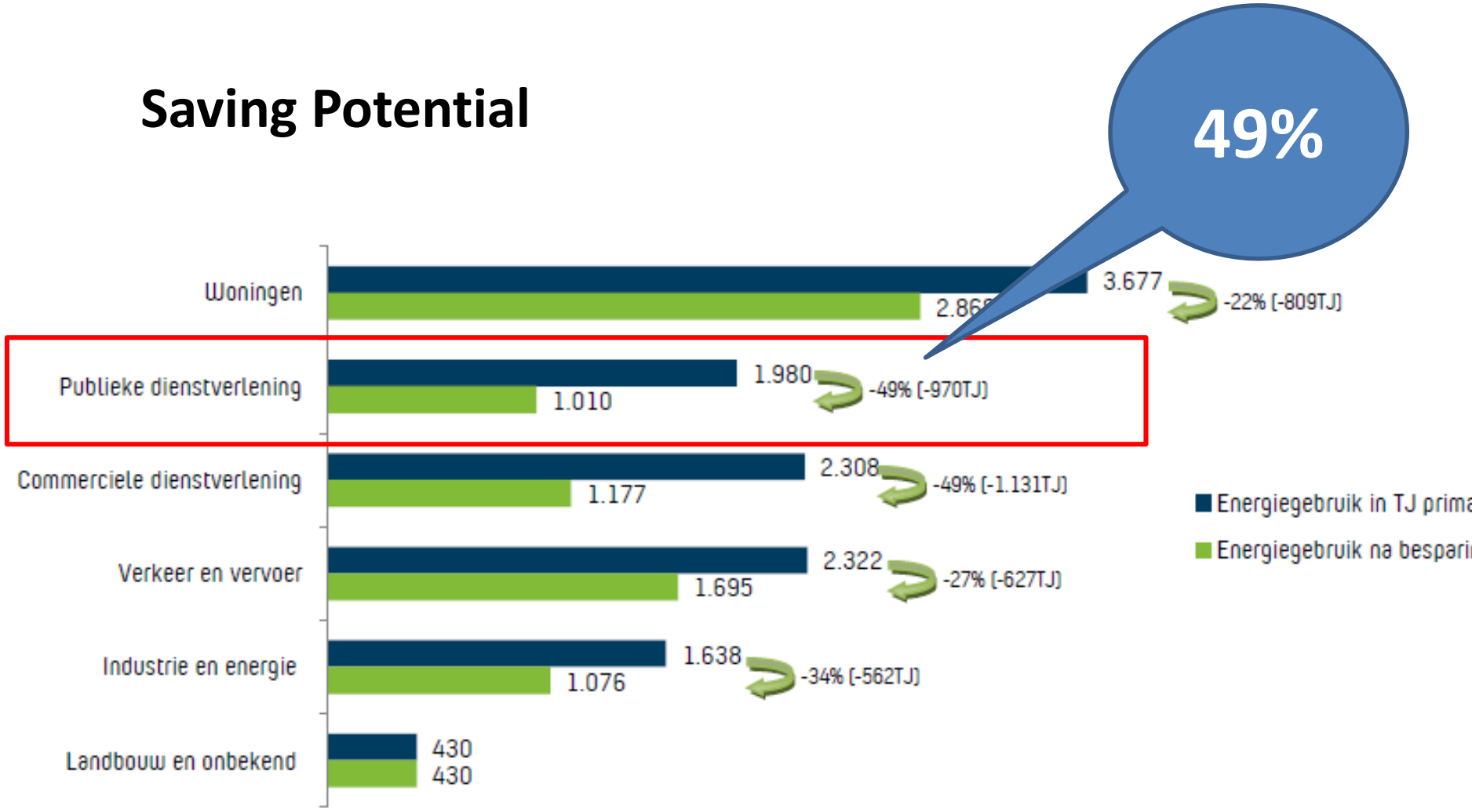

PARKSTAD LIMBURG
ENERGIETRANSITIE PALET
ambitiedocument
ON
CBS
IKEA
parkstad
stadsregio limburg


NU
OPWEKKING DOOR FOSSIELE ENERGIEBRONNEN
29,6 PJ
WARMTEVERLIES
ENERGIEPOTENTIES
ENERGIE BESPARING 10,1 PJ
DUURZAME ENERGIE OPWEKKING 20,8 PJ
STRAKS IN 2040
ENERGIE BESPARING 10,1 PJ
DUURZAME ENERGIE OPWEKKING 13,0 PJ
HOGERE EFFICIENTIE
DUURZAME ENERGIEBRONNEN
2016-2020
8%
ENERGIE BESPARING
0,80 PJ
8%
DUURZAME ENERGIE OPWEKKING
1,04 PJ


8%
12%
30%
30%
12%
8%
2020
2024
2028
2032
2036
2040

Samenvatting projecten Heerlen 2016-2020

Saving Potential



PROSPECT Traineeship

- Exchange of local knowledge and expertise
- Using an Energy Agency as an organisational instrument
- Almada Fund as a financial instrument

PROSPECT OUTCOME for Heerlen

- Inspiration
- Woonwijzerwinkel / Center of Expertise / Taskforce
- Almada Fund not usefull yet
- Payback/ Reward inspired us

- **5000 solarpanels in the city center**

People make the city

CITIES CITIZENS ENERGY FORUM

22-24 APRIL 2020

Heerlen
The Netherlands

ENERGYCITIES

Klimaatverbond Nederland

provincie limburg

parkstad stadsregio limburg

brunssum • heerlen • kerkrade • landgraaf • nuth • onderbanken • simpelveld • voerendaal

AGENEAL

Agência Municipal de Energia de Almada

AGENEAL:

paving the way towards a low carbon community in Almada: the role of Almada Less Carbon Climate Fund

Lessons from the PROSPECT project

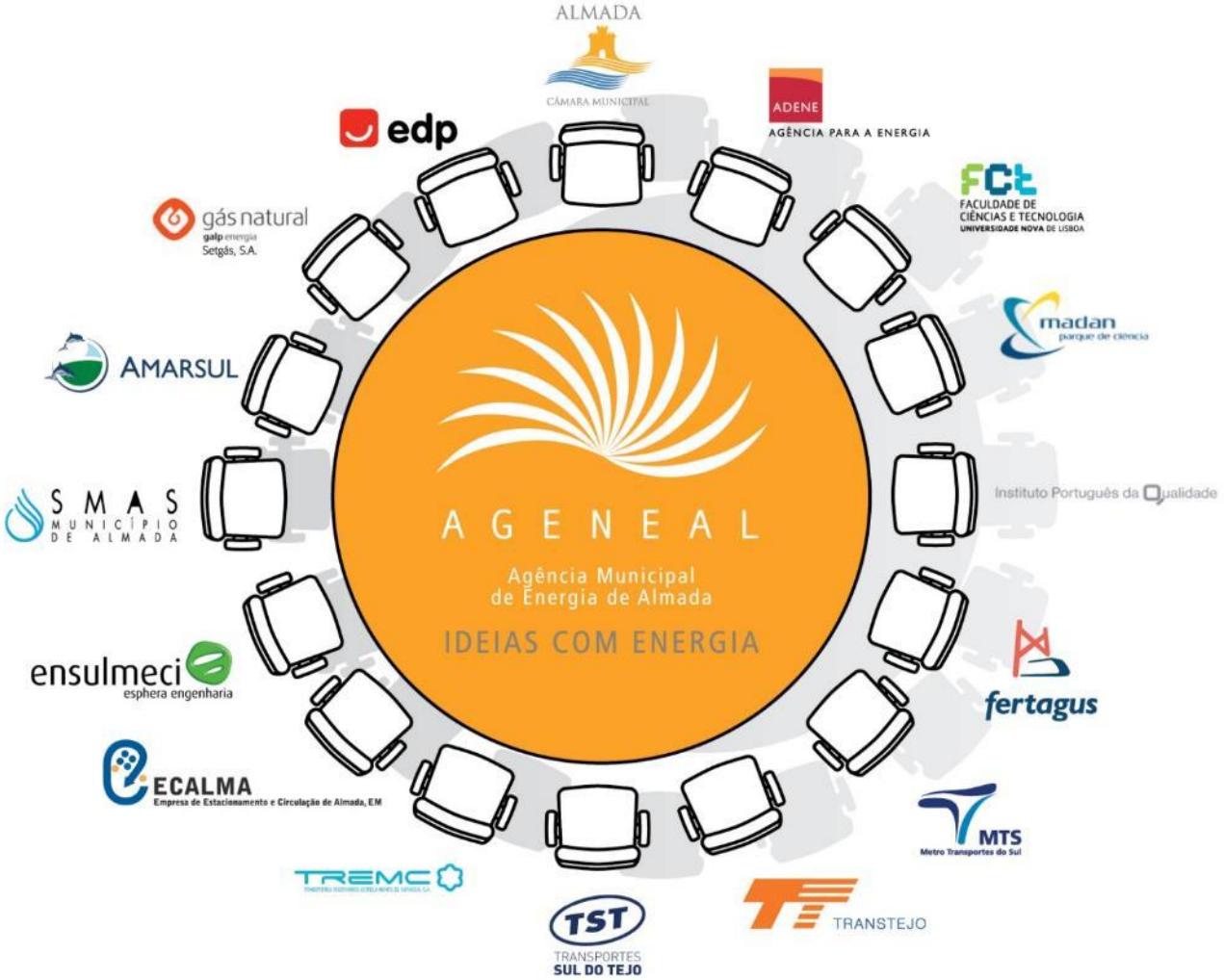
João Cleto

- Private, non-profit association (governed by public law)
- Created in the framework of the SAVE Program | 30/03/1999
- Objectives:

  "… contribute to increase the energy efficiency, through the rational use of energy and to improve the use of endogenous energy resources."

  "… establish as a **Local Platform or Forum** for energy and climate."

- Currently 16 associates/stakeholders


ALMADA
CÂMARA MUNICIPAL
ADENE
AGÊNCIA PARA A ENERGIA
edp
FCT
FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA
gás natural
galp energia
Setgás, S.A.
madan
parque de ciência
AMARSUL
Instituto Português da Qualidade
SMAS
MUNICÍPIO DE ALMADA
AGENEAL
Agência Municipal
de Energia de Almada
IDEIAS COM ENERGIA
ensulmeci
esphera engenharia
fertagus
ECALMA
Empresa de Estacionamento e Circulação de Almada, EM
MTS
Metro Transportes do Sul
TREMC
TST
TRANSPORTES
SUL DO TEJO
TRANSTEJO

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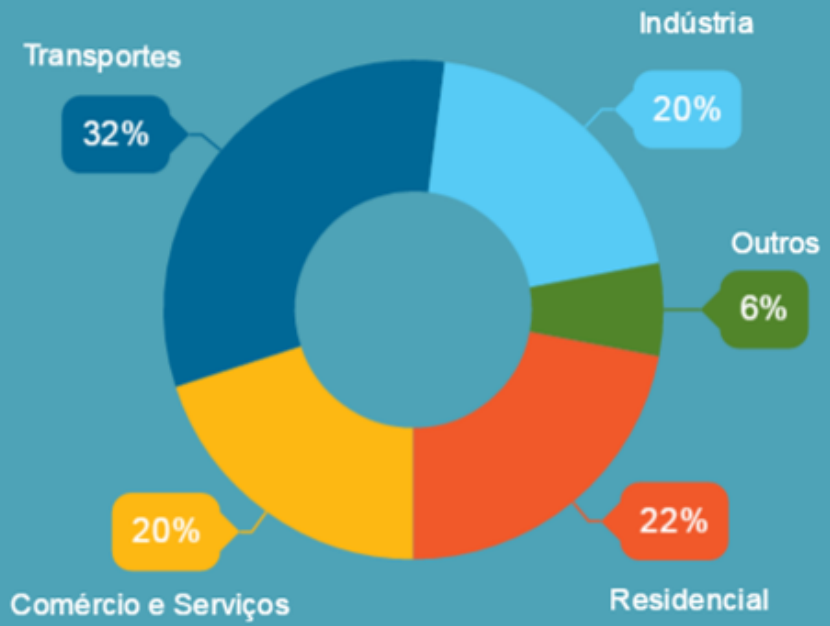
PLAC
PLATAFORMA LOCAL ALMADA CLIMA

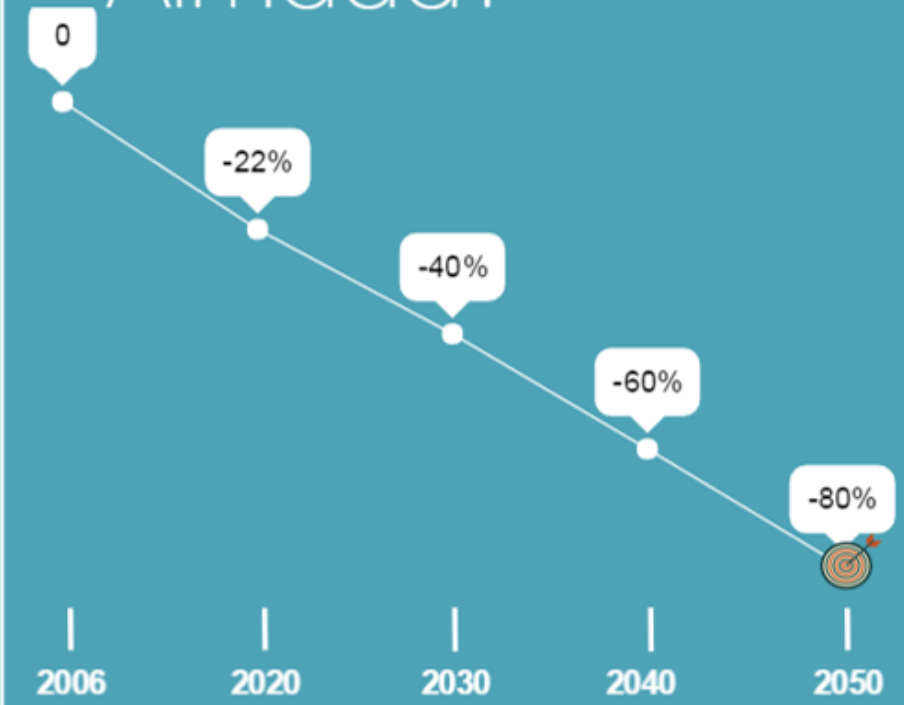
Almada a caminho da cidade neutra em carbono

Peso dos setores de atividade nas emissões de GEE



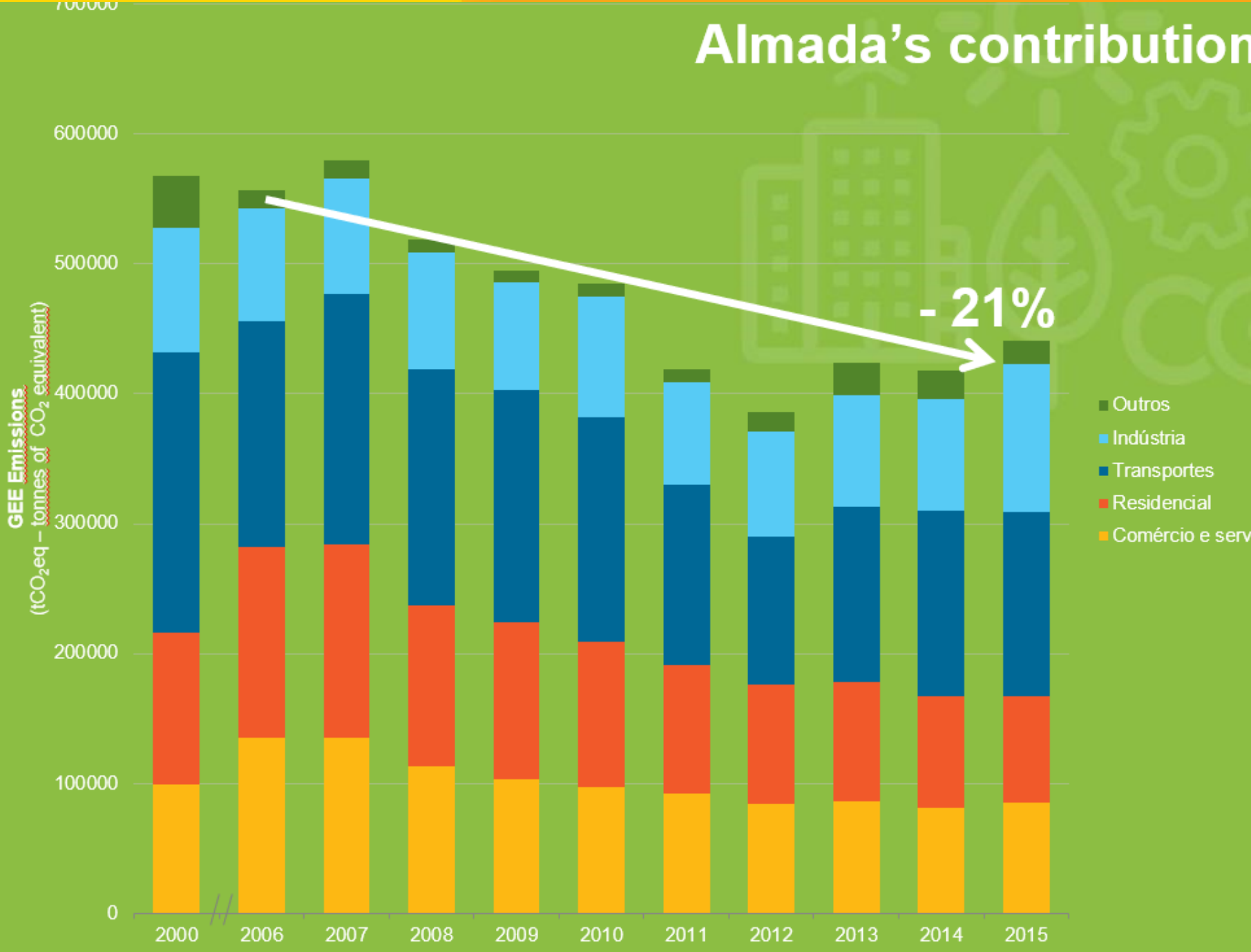
Os sectores dos transportes e edifícios (residencial e comercial) são responsáveis pela grande fatia das emissões - 75%.

Um caminho para 2050 em Almada?

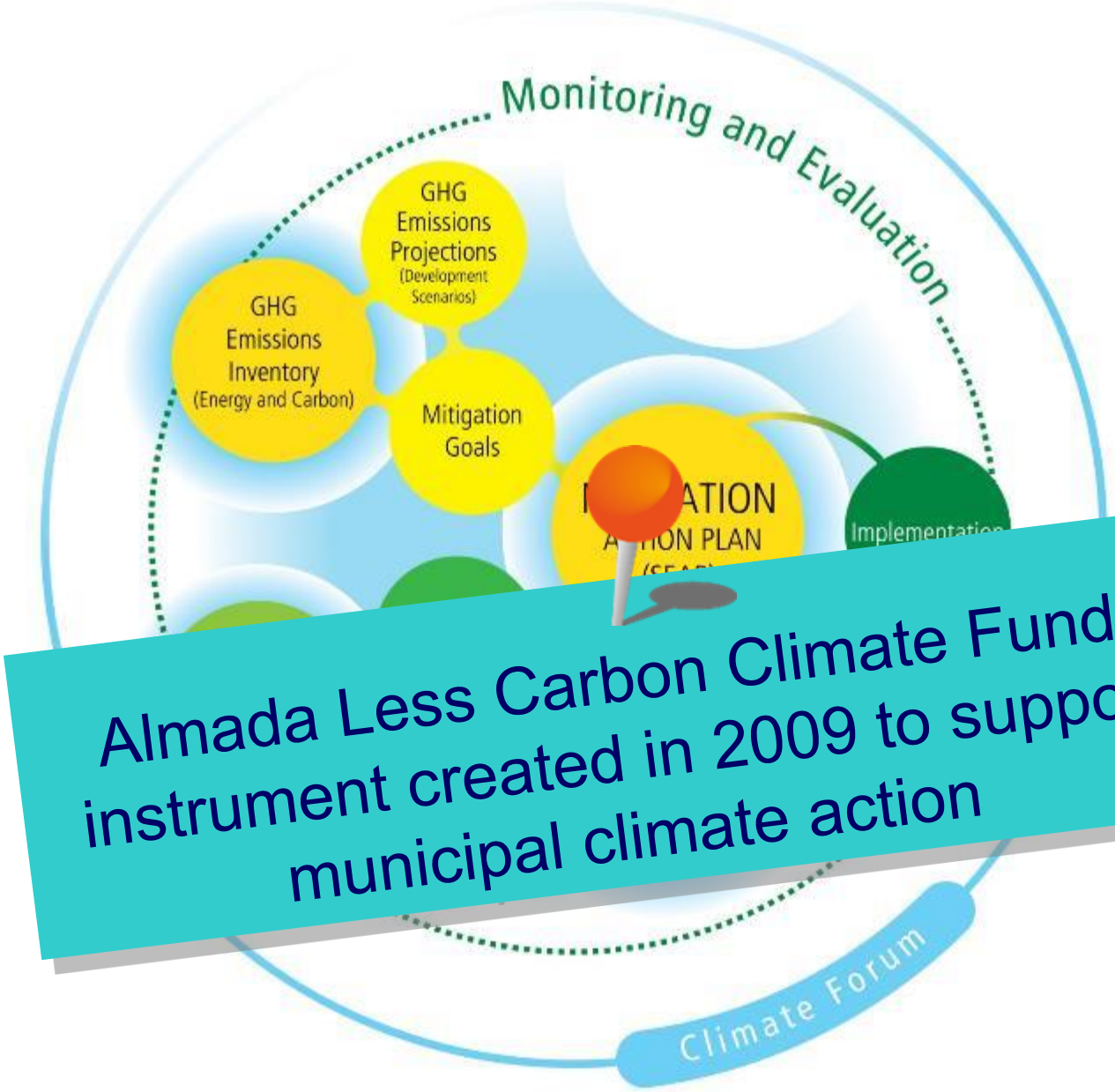


Possível trajetória de redução das emissões de GEE face ao ano base (2006) para garantir metas assumidas.

Almada's contribution




Monitoring and Evaluation
GHG Emissions Projections (Development Scenarios)
GHG Emissions Inventory (Energy and Carbon)
Mitigation Goals
MITIGATION ACTION PLAN (SEAP)
Implementation
Future vulnerabilities
Current vulnerabilities
ADAPTATION ACTION PLAN
Climate projections
Climate Forum



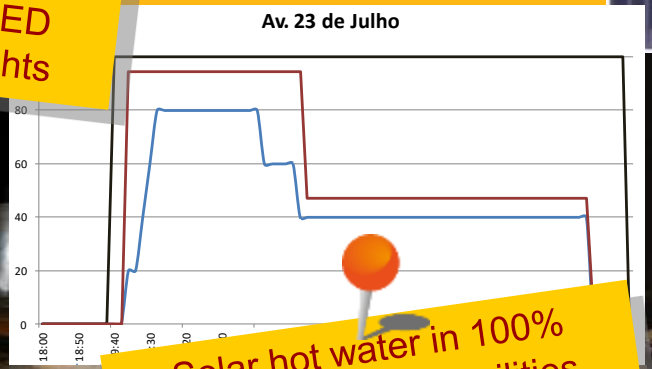
Almada Less Carbon Climate Fund, instrument created in 2009 to support municipal climate action

ALMADA CARBONO MENOS®

Smart Public Lighting

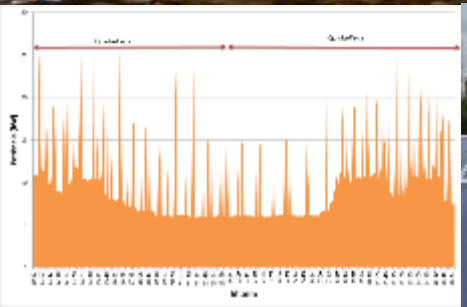
Energy certification of municipal buildings

100% LED traffic lights



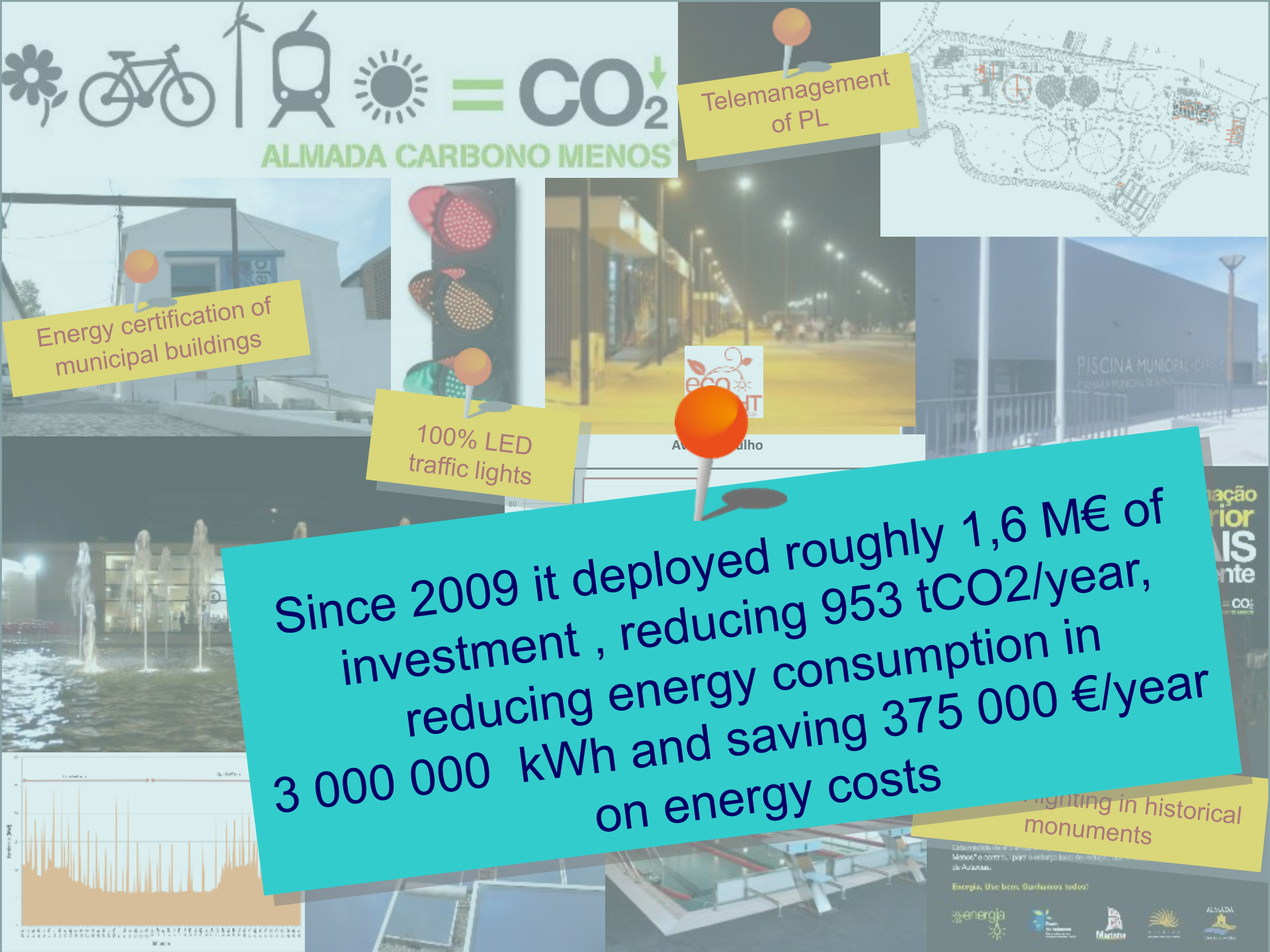
Solar hot water in 100% municipal sports facilities

Efficient lighting in historical monuments



Social Housing: Energy Eficiency + Hybrid solar system – Presented during the PROSPECT mentoring session

✓ - 30 MWh ✓ - 1t CO_2 ++ comfort, life quality, inclusion, empowerment


= CO2
ALMADA CARBONO MENOS
Telemanagement of PL
Energy certification of municipal buildings
100% LED traffic lights
PISCINA MUNICIPAL
Since 2009 it deployed roughly 1,6 M€ of investment , reducing 953 tCO2/year, reducing energy consumption in 3 000 000 kWh and saving 375 000 €/year on energy costs
monuments

AGENEAL
Ideias Com Energia

ALMADA CARBONO MENOS

Challenge !

Refurbish the Almada Less Carbon Climate Fund to a revolving fund

Why ?

Who uses the energy, does not pay for the energy

No analytical accounting and concentration on financial office

Idea !

Hybrid solution, using existing mechanism but mimicking inflow to fund of energy savings and outflow to “clients”

Almada Less Carbon "Revolving fund"

- Benefits of energy bill savings go to the fund and to the beneficiary department
- Applying concepts/principles of energy performance contracts, without the need for external entities (ESCO's)
- Agreement ("contract") between beneficiary departments and manager of the fund
- Keep initial structure to ensure continuity of existing mechanism and financial flow

"Intracting" principles – Just google "energy cities intracting" for more info

ALMADA CARBONO MENOS

Beneficiary Dep. 1

Beneficiary Dep. 2

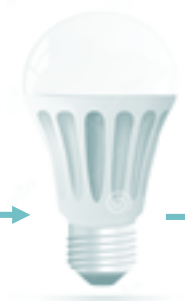
Beneficiary Dep. 3

Beneficiary Dep. ….

DECAM

Financial Dep

Others…



IDEA/PROJECT

Almada Less Carbon Fund
(r)Evolved

Fund Manager (Energy Dep.)

+

Financial Dep., Energy Agency (tech support)

Evaluating and prioritizing measures (Cost_Benefit Analysis)

↓ CO_2

↓ kWh

↓ €

IDEA/PROJECT APPROVED!

Financing

€

€

Anual Savings

Shared between the fund and the beneficiary department

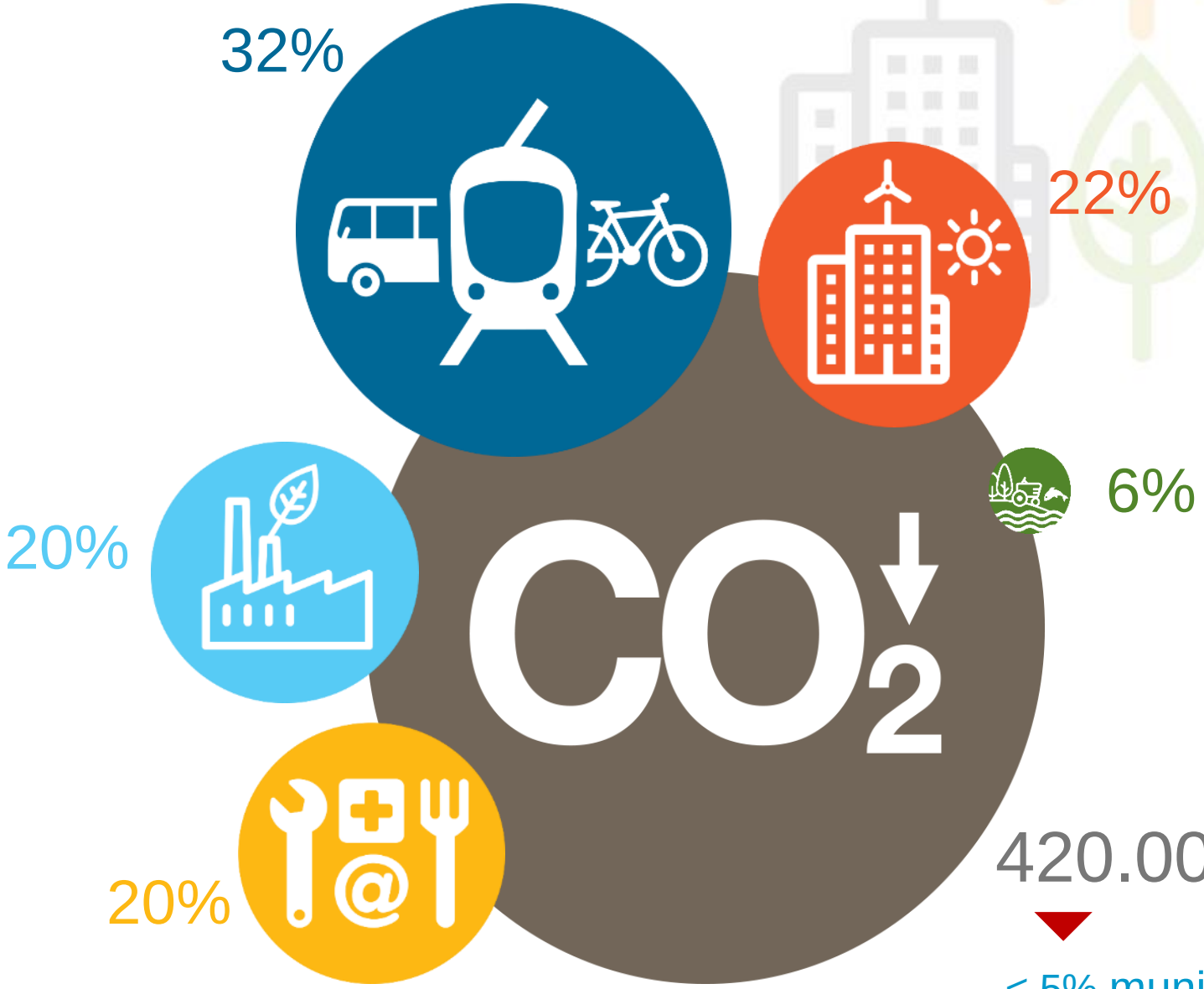
Implementing measure

Agreement between Energy Dep. (Fund Manager), Financial Dep. and **Beneficiary Dep.**

- … Measure Description
- … Savings or income foressen (indicators CO_2, kWh and € / year)
- … Investment Cost
- … Payback
- … Energy Savings Index
- … Saving Reversion Rate to Fund and Beneficiary Department
- … Defining operational an maintenace procedures (if applicable)
- … Non Compliance Procedure

infinitesolutions
FINANCING ENERGY TRANSITION IN CITIES

The municipality has been a frontrunner. But this is not enough!



420.000 tCO_2

< 5% municipality

Way forward

Limitations of current approach:

- Totally internal procedures
- Limited connection to the community besides social housing: projects are within the municipality infrastructure (they can impact directly a small fraction of private use of buildings)
- Own Investment limits size of projects (sometimes small projects are difficult to finance, due to their low return on investment)
- Projects are evaluated individually, little room for synergies between projects
- Limited external investments (except for national/european funding)

Way forward

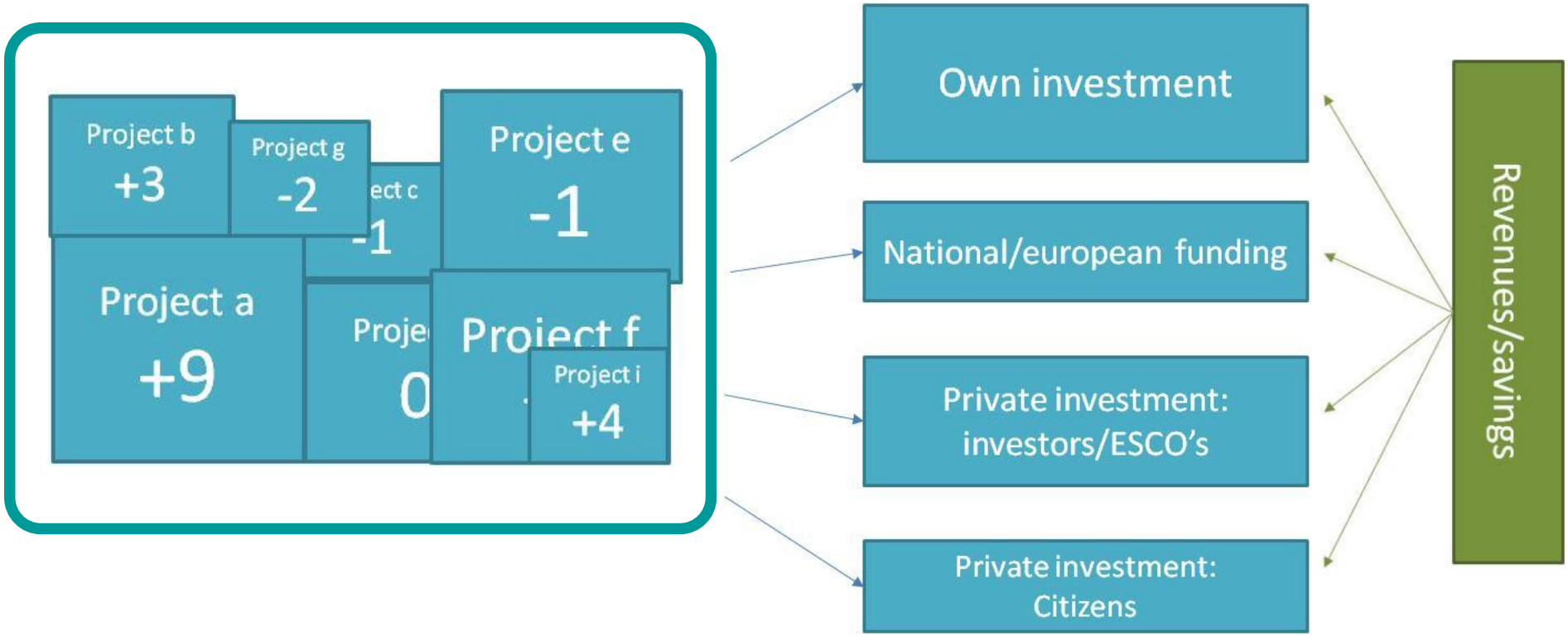
Limitations of current approach:

- Totally internal procedures
- Limited connection to the community besides social housing: projects are within th municipality infrastructure (they can impact directly a small frac ion of private
- Own Inv projects
- Project betwee
- Limited external investments (except for national/european funding)

Lessons from Herleen here!
Push further for private involvement

Way forward

Bundle Projects, make it bankable



Way forward

Bundle Projects

- Allows financing for “non-elegible” projects from a strictly economic evaluation (specially relevant for combined projects on mitigation and adaptation)
- Increases direct participation of the community (enables participation on community projects and awareness which can also boost own private investment)
- Increase investment size limits
- Generate new ideas, community projects, add visibility and accountability of the projects – everyone will want to check where their money is!

AGENEAL
Ideias Com Energia

PONTOenergia
INVESTIR NUM FUTURO EFICIENTE

BALCÃO ÚNICO DO INVESTIMENTO
EM EFICIÊNCIA ENERGÉTICA

Project was presented on the last edition of the Covenant of Mayors Investment Forum – check www.pontoenergia.pt or the presentations from 2019

Way forward from PROSPECT

Ancillary outcomes

- The exchange between Almada, Heerlen and the facilitator was very interactive. The learning program gained from this approach. Instead of a direct mentor -> mentee approach, common learning was the main focus.
- The concepts, ideas and projects were successfully shared and inter-learning between all participants, including colleagues from another Portuguese energy agency

Way forward from PROSPECT

Common recommendations

- Bring decision makers to the process from the beginning
- Establish strong cooperation with the core team and involve financial and legal expert colleagues also from the beginning
- Take advantage projects already in development to explore and test the scheme – we all have projects going on, just use them!

We even managed to steal an idea from Herleen for our own fund….

ALMADA CARBONO MENOS

Beneficiary Dep. 1

Beneficiary Dep. 2

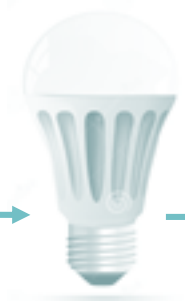
Beneficiary Dep. 3

Beneficiary Dep. ….

DECAM

Financial Dep

Others…



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↓ kWh

↓ €

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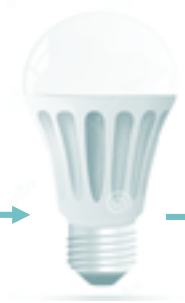

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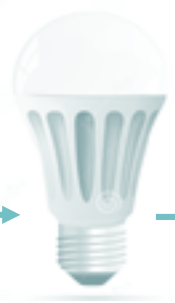

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€

"REAL" Savings

€

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Thank you for your attention!

joao.cleto@ageneal.pt