MOTIVES & TOOLS TO ENABLE CITIZENS TO BECOME "SMART CONSUMERS": A "SOCIALLY-ORIENTED" APPROACH TOWARDS SMART ENERGY CONSUMPTION IN BUILDINGS

Dr. Ch. Vlachokostas

Email: vlachokostas@teemail.gr

Board Member TCG / Region of Central Macedonia

Former Vice President / General Assembly of TCG

Introduction

- Nowadays, over half of the world's population is living in urban conurbations / buildings.

- The anthropogenic pressures on the environment have reached nowadays critical levels in areas worldwide.

- Urbanization, which is a continuous process, has led not only to economic and social **transformation** but also to high resource consumption and considerable environmental damage that can be attributed to many economic sectors.

  ❑Among others ⟶ Building Sector

- Buildings exert significant environmental load attributed to energy consumption (heating, cooling, lighting, cooking).

Introduction

- Efficient use of Resources: key challenge for the building sector in the continuous effort to encounter environmental deterioration, face climate change risks and eventually promote sustainability.

:

  - Promotes a "socially-oriented" hybrid approach towards **Smart Energy Consumption** in buildings.

  - Discusses motives and tools to enable citizens to become "smart consumers".

- Need → As the world population urbanizes - Smarter and more Energy-efficient Buildings.

Options put forward by our Chamber:

- Retrofitting of houses to save energy and costs with payback periods of a few years – Relenant EU (structural and investment funds) and Hellenic funding instruments.

- Energy inspectors for buildings, TOTEE/KENAK 2017 Standards/Procedures.

- Smart finance for smart buildings: investing in Energy Efficiency&RES in Buildings (EIB) – "energy efficiency first".

- Key areas include:
  - Increase the refurbishment rate.
  - Better building design to reduce Heating & Cooling, by insulation.
  - Putting forward initiatives for sustainable energy.

Options put forward by our Chamber:

- RES (Greek Tourism Expo 2017 Prototype Bioclimatic Room).

- Energy-efficient lighting technical innovations.
- Reducing Energy Poverty.
- Minimizing carbon footprint.
- Emphasis on energy cost (not just construction cost).

Thessaloniki

Snapshots


ARISTON






The Problem is still there…

- Although key areas for improvement are well known&promoted in the building sector, energy efficiency and rationalization of energy use are still the core of the problem.
- Mitigation options are faced with many barriers, such as consumer behavioral patterns and preferences.
- Slow progress of existing policy frameworks and their capability of absorbing digital evolution (digitalization and sharing data).
- Lack of interaction/cooperation between responsible (public) authorities and departments.

- Lack of interaction between citizens/consumers.

The Problem is still there…

- Result of unsustainable practices, e.g. the fossil fuel use.
- Both "Smart Buildings" and "Smart Consumers" is all about "Smart Citizens".
- Concerned about: increasing the quality of life of their fellow-citizens, (ii) protecting their environment, (iii) sustainability.
- Research into the determinants of consumers behavior has shown that an improvement of the Individual and **Collective** behavior can be obtained if citizens are more exposed to information, engaged as part of a community.
- The participation of **citizens as consumers** is not sufficient enough.

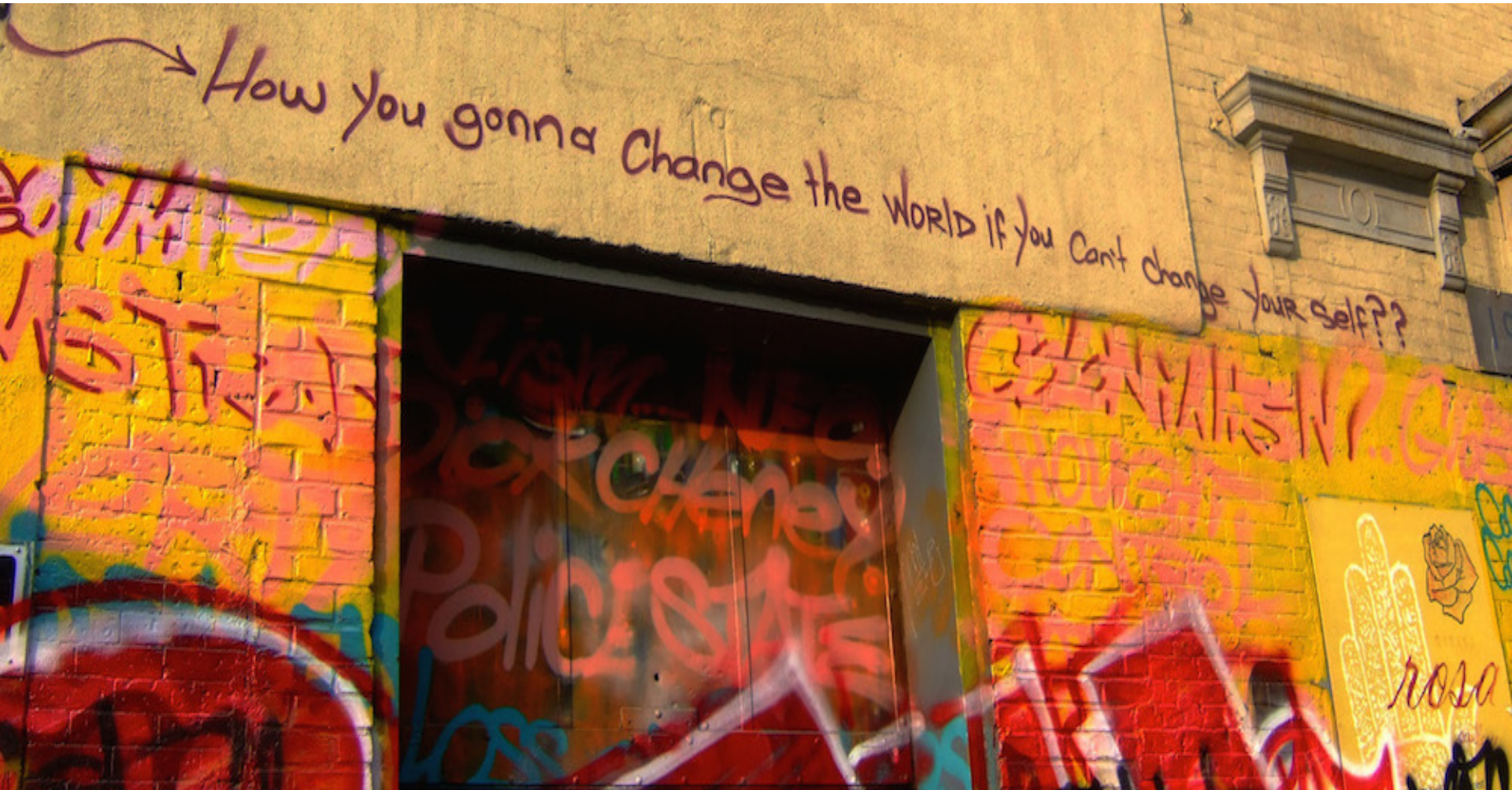
Options in the building sector

- Simple&Acceptable lifestyle changes or habits can save both Energy&Money.
-  e.g. estimation: in a typical office building, cooling the interior to 25°C rather than 18°C, when the outside temperature is 32°C, would make energy **Savings** 25-50%, depending on the amount of waste heat generated inside the building.
- Developing&Choosing more energy efficient individual appliances is another major potential saving.
- Setting heating in winter to lower temperatures (along with putting on a sweater). 
- Cooling in summer to higher temperature settings (and dispensing with jackets and ties).

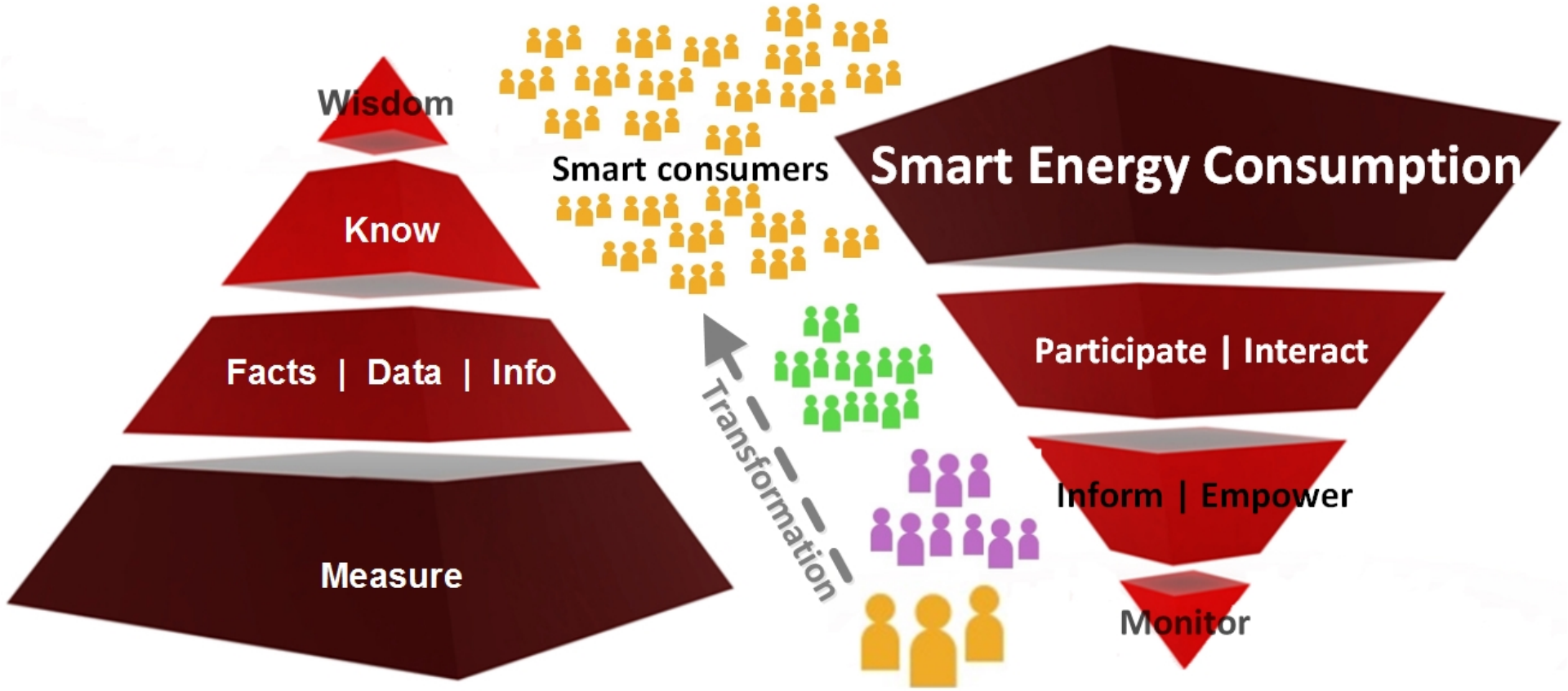
Combine: Networks – Knowledge - Sensors

- In order to efficiently encounter sustainability threats, promote energy efficiency and rational use of energy the combination of networks of people, knowledge and sensors is necessary.
- These threats are usually addressed separately, with a top-down approach (from policy-makers& authorities to citizens) and not in a holistic "hybrid" way.
- Hybrid in terms of combining a top-down (from authorities to consumers) and a bottom-up approach (from consumers to authorities).
- Empowerment is missing…

A bottom-up perspective with "smart citizens" is needed…



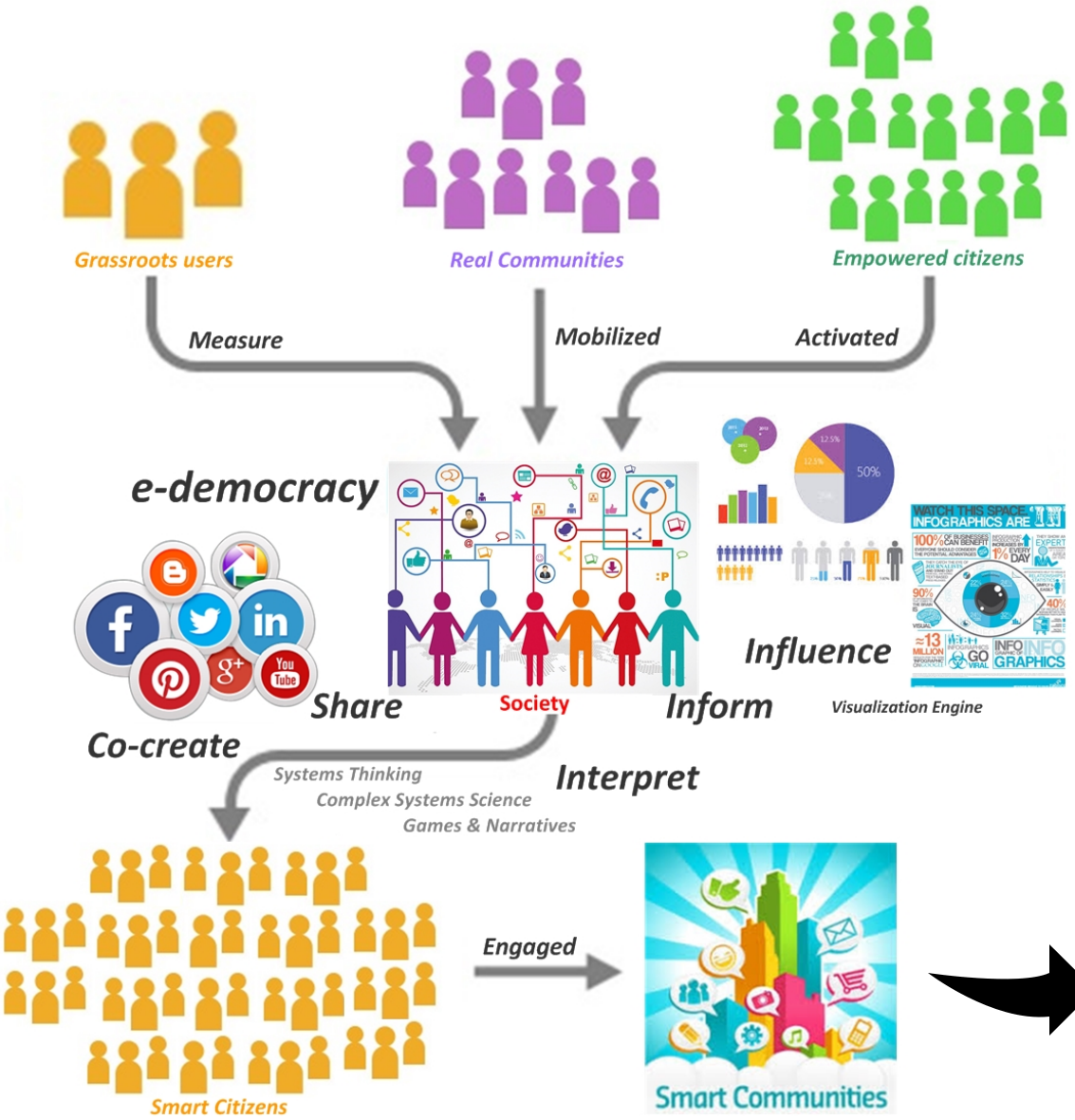
ICT is crucial towards a "Socially-oriented" bottom-up



Pyramid of the levels of citizens' interaction to enable citizens to become "Smart Consumers"

Consumers' challenge…

Collective Intelligence concept



Creating tools and motives

- Collective awareness for a hybrid participatory effort is the basis to effectively improve energy efficiency and promote rational use of energy in the building sector.

- Collective Awareness Platforms for Sustainability & Social Innovation(CAPs) raise awareness collectively and transform it into behavior change.

- CAPs provide opportunities for citizens' empowerment to fully collaborate&promote better informed decision-making processes.

- Approaches that will empower citizens, through participation and interaction to adopt more sustainable individual and collective behaviors and lifestyles.

- Bottom-up participatory paradigms via ICT-based collective awareness and collaborative activities of citizens'.

CAP paradigms

- **DeCarbonNet**

RAISE INDIVIDUAL&COLLECTIVE AWARENESS

Collectively building knowledge
on the impact of everyday behavior&
effective ways to change it.

TRIGGER BEHAVIOURAL CHANGE& FOSTER SOCIAL INNOVATION

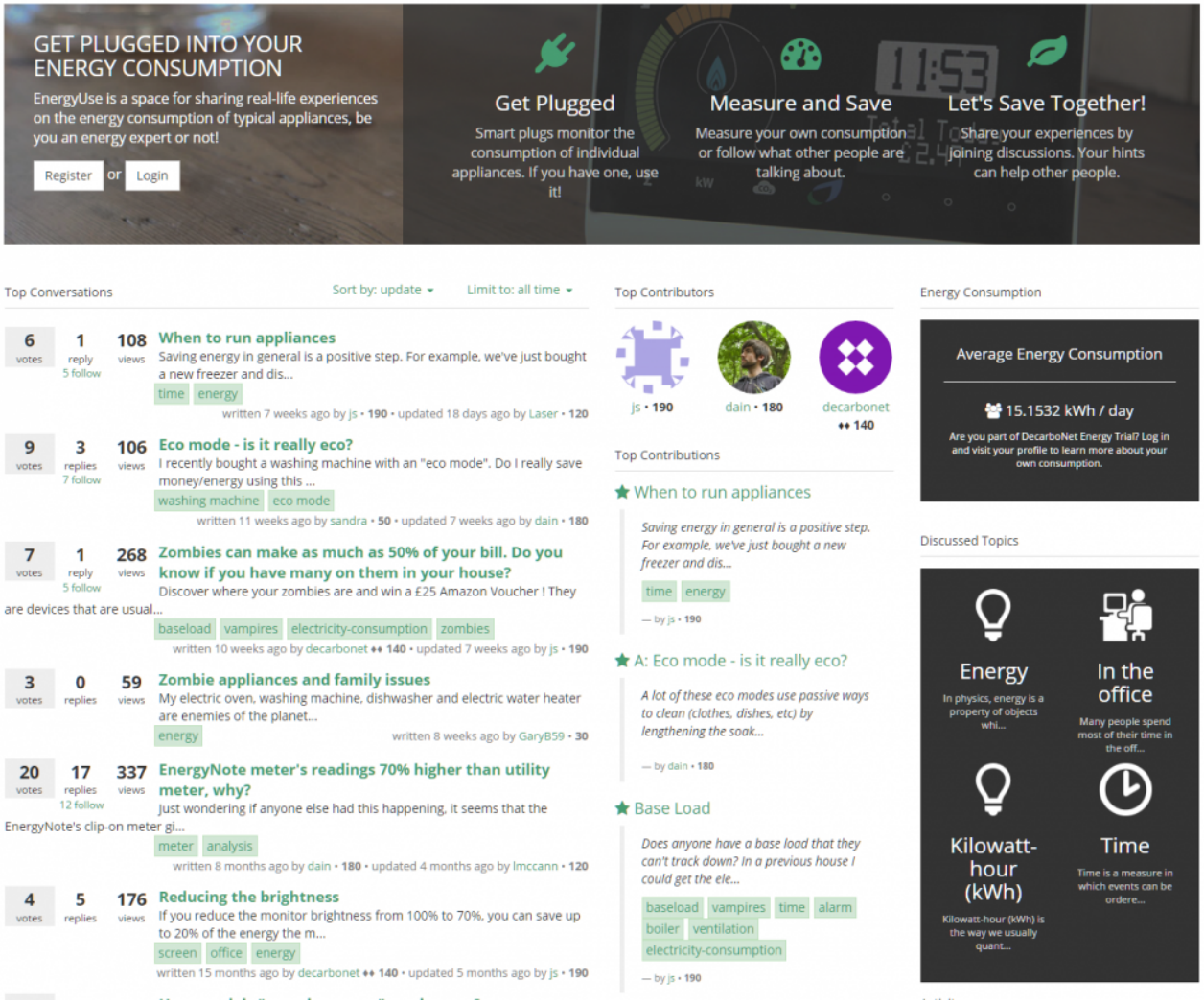
Understanding the behavior change
dynamics and providing appropriate tools
that contribute to every stage of this process.

Interested in learning about your appliances' energy consumption?

ANALYSE BEHAVIOURAL PATTERNS &INFORMATION DIFFUSION

By developing methods and tools to analyze how information can effectively reach society and stakeholders through the social media.

On-line community



EnergyUse is Decarbonet online community for sharing real-life experiences on the energy consumption of typical appliances (https://energyuse.eu/)

Creating tools and motives

- enCOMPASS (Collaborative Recommendations and Adaptive Control for Personalised Energy Saving)
- MOBISTYLE (MOtivating end-users Behavioral change by combined ICT based tools and modular Information services on energy use, indoor environment, health and lifestyle)
- OrbEEt (ORganizational Behaviour improvement for Energy Efficient administrative public offices)
- ENTROPY (Design of an innovative energy-aware IT ecosystem for motivating behavioural changes towards the adoption of energy efficient lifestyles)

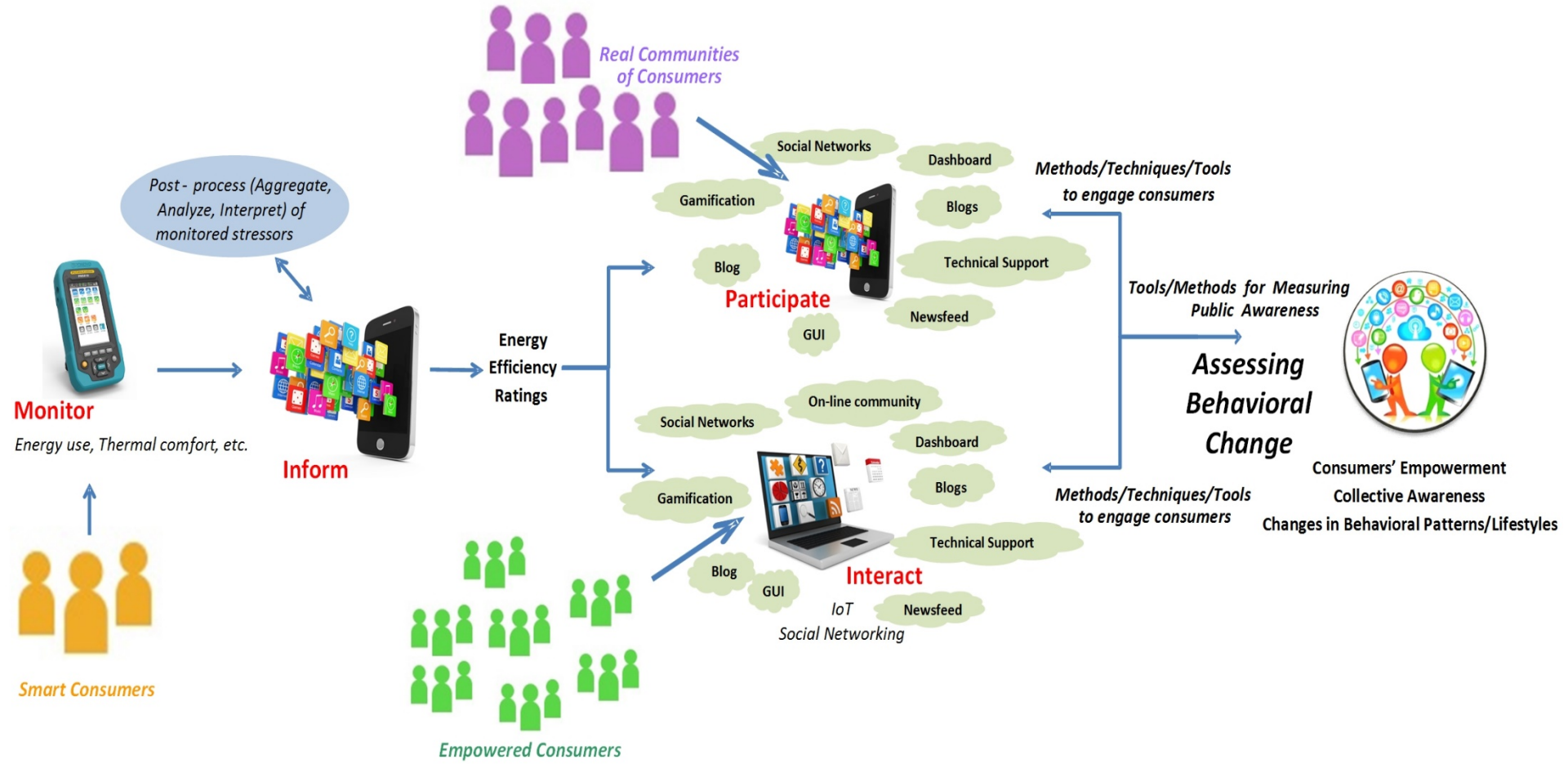
GREEN PLAY

EnerGAware
Energy Game for Awareness of energy efficiency in social housing communities

Creating tools and motives

- E-techniques to engage citizens in sharing knowledge and expertise and improve their quality of life.
- Tackle citizens' opinions, willingness and knowledge regarding alternative behaviors/possible solutions.
- Assure improved transparency of information related to the impact of energy/environmental policies.
- Assessment of societal behavioral change.
- Inform, Empower, Participate, Interact towards collective intelligence…

ICT towards collective intelligence…



Holistic characterization

Available online at www.sciencedirect.com

ScienceDirect

Procedia Environmental Sciences 38 (2017) 571 – 577

Procedia
Environmental Sciences

International Conference on Sustainable Synergies from Buildings to the Urban Scale, SBE16

A Holistic Methodological Approach in the Urban Context Towards Characterizing the Environmental Performance of Buildings and Promoting Strategic Governance and Sustainability

Ch. Vlachokostas[a,*] , A.V. Michailidou[a], E. Feleki[a], Ch. Achillas[b], N. Moussiopoulos[a] and O. Trasanidis[a]

[a]*Aristotle University Thessaloniki, Laboratory of Heat Transfer and Environmental Engineering, Thessaloniki,54124,Greece*
[b]*International Hellenic University, School of Economics, Business Administration and Legal Studies, Thermi, 57001, Greece*

Dr. Ch. Vlachokostas

Board Member TCG/ Region of Central Macedonia

Former Vice President General Assembly of TCG

School of Mechanical Engineering, Aristotle University of Thessaloniki

Adjunct Professor, Climate Change and Energy Strategies, MSc Sustainable Development, International Hellenic University

Email: vlachokostas@teemail.gr

Thank you for your attention!!