SOCIETAL CHALLENGE 3: Secure, clean and efficient energy

ICT-based solutions for energy efficiency

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Outline

- Policy context
- H2020 – SC3 overview
- ICT for energy efficiency in WP 2014-15
  - EE11 New ICT-based solutions for energy efficiency
  - EE8 Public Procurement of Innovative Sustainable Energy Solutions

Policy at EU level

1. March 2010 - Europe 2020: Smart, Sustainable and inclusive Growth

Confirmation of three 20% targets for 2020

- Reduce GHG emissions by at least 20% compared to 1990 levels or by 30% if the conditions are right
- Increase the share of renewable energy in final energy consumption to 20%
- Achieve a 20% increase in energy efficiency

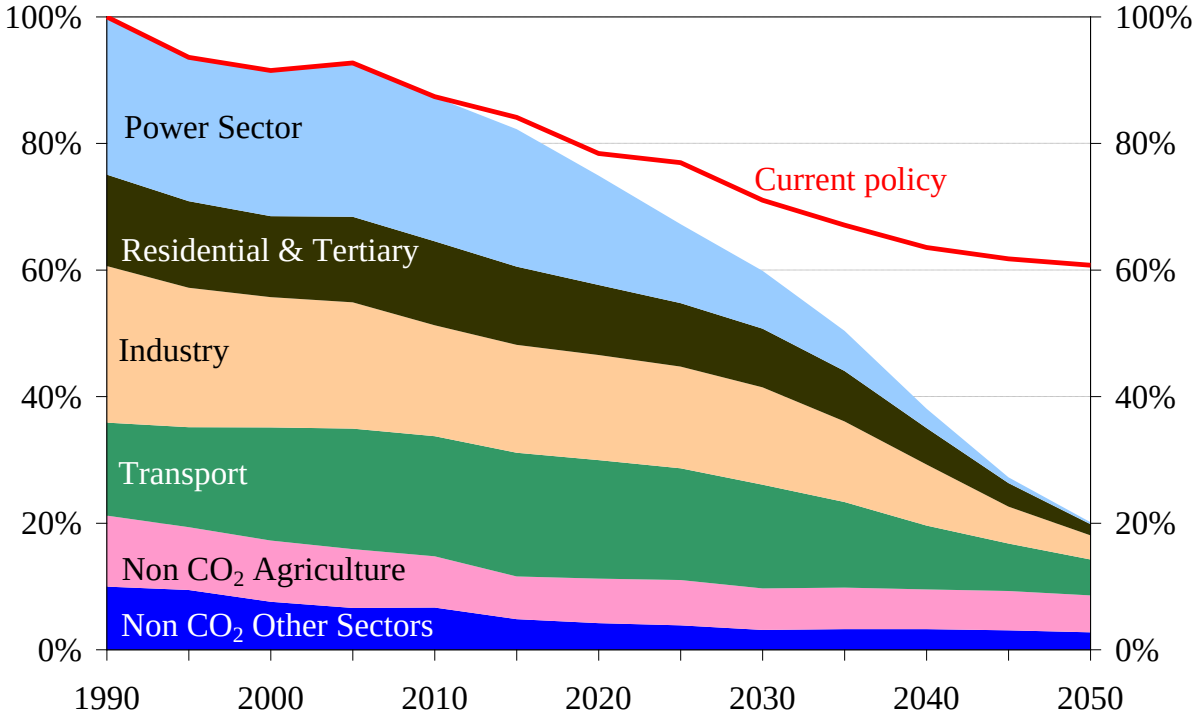
2. March 2011 - A Roadmap for moving to a competitive low carbon economy in 2050 - http://ec.europa.eu/clima/policies/roadmap/index_en.htm

- Reduce GHG emissions by 80-95% by 2050 compared to 1990
- A fully decarbonised Power Sector

3.January 2014 – A policy framework for climate and energy in the period from 2020 to 2030 - http://ec.europa.eu/clima/policies/2030/index_en.htm

- Reduce GHG emissions by 40% below the 1990 level by 2030
- Increase the share of renewable energy to at least 27% by 2030
- The role of energy efficiency in the 2030 framework will be further considered in a review of the Energy Efficiency Directive due to be concluded later in 2014

EU GHG emissions towards an 80% reduction (100% =1990) by 2050



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Policy: How can ICT *contribute*?

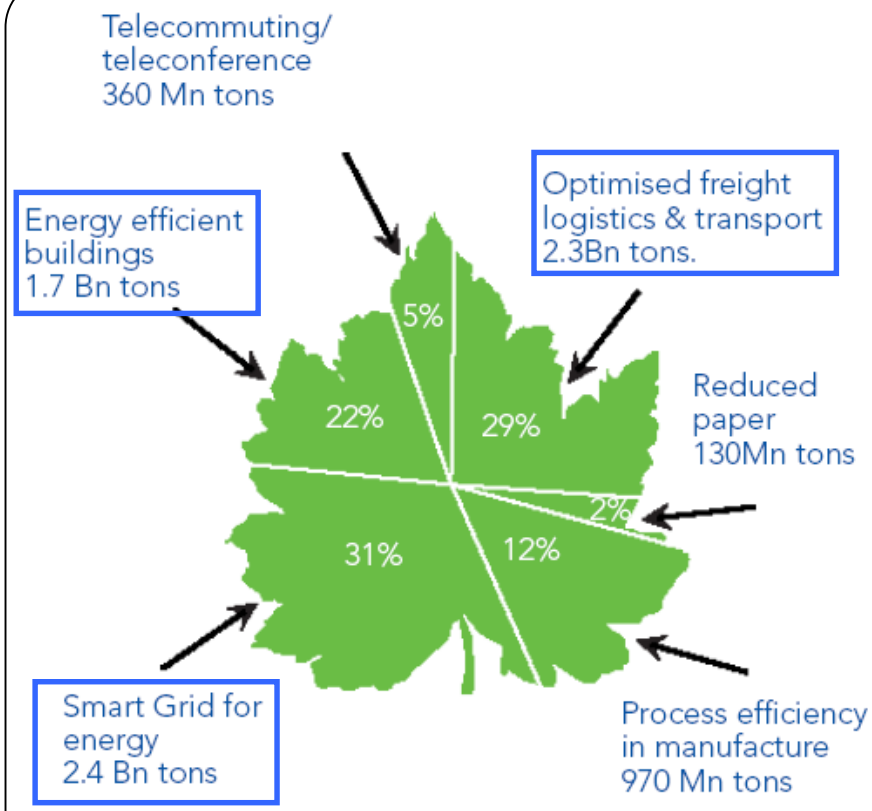
- ICT can bring about direct efficiency gains and can help drive behavioural change:
  - measuring, monitoring, intelligent management and control
  - providing reliable data to governments, industries, citizens about energy consumption / carbon emissions
  - Substituting physical products by virtual services
- **However:**
  - Rapid growth of electricity used by ICT: today responsible for 8% of electricity consumed in the EU and expected to double by 2020

The fragile energy balance

Energy Reductions enabled by ICT

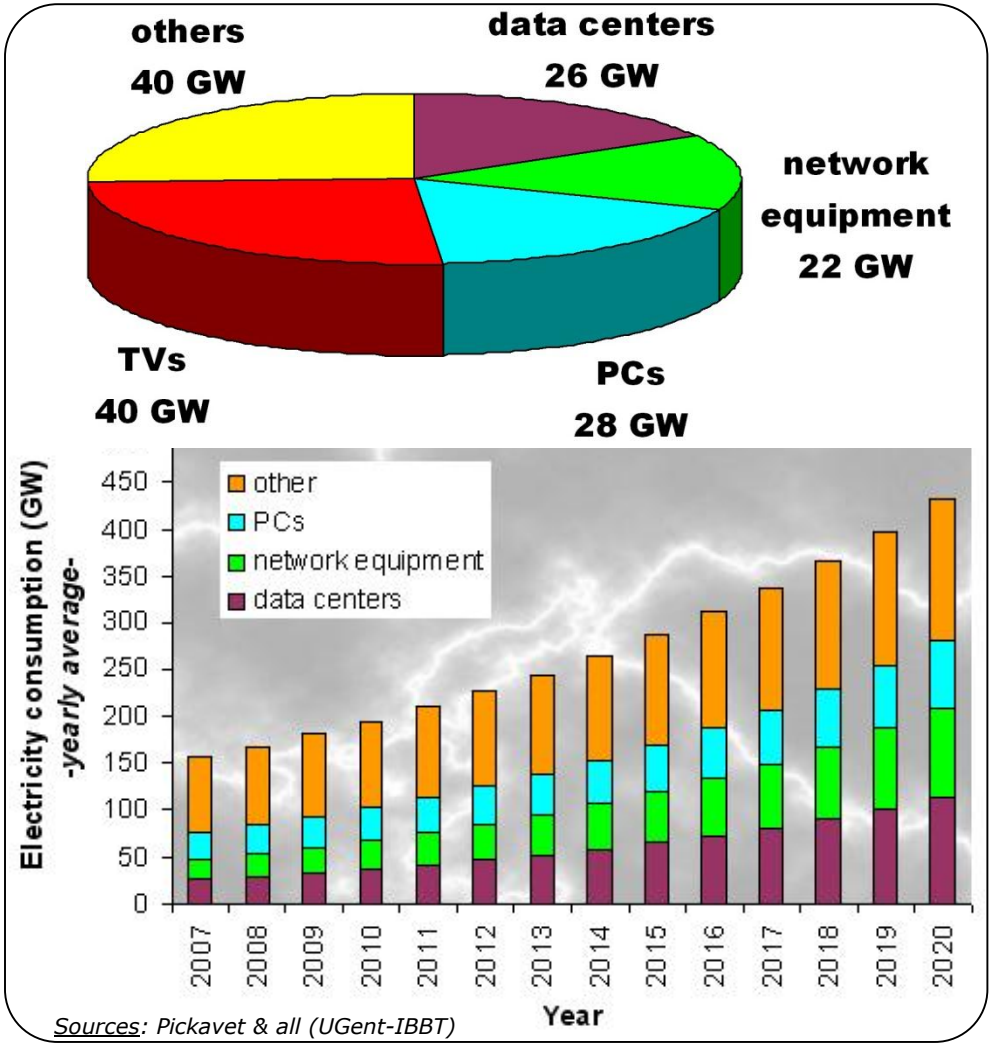
Energy Consumption of ICT solutions

~8% of total electricity consumption
~15% by 2020



By 2020, GeSI forecasts 15% global reduction in emissions by applying ICTs, some 7.8 Bn tons

Source: An ICT policy agenda to 2015 for Europe (Swedish Presidency)



Sources: Pickavet & all (UGent-IBBT)

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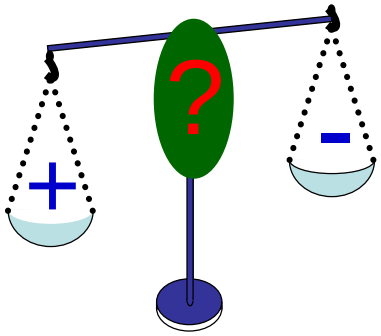
Towards a Common Methodology: An agreed measurements framework to define environmental KPIs for ICT's impact is a precondition

The Issue



+ ICT as enabler to contribute to energy, resource efficiency targets
- Negative impact of ICT on the environment

How to measure the overall impact of ICT?

EC Approach

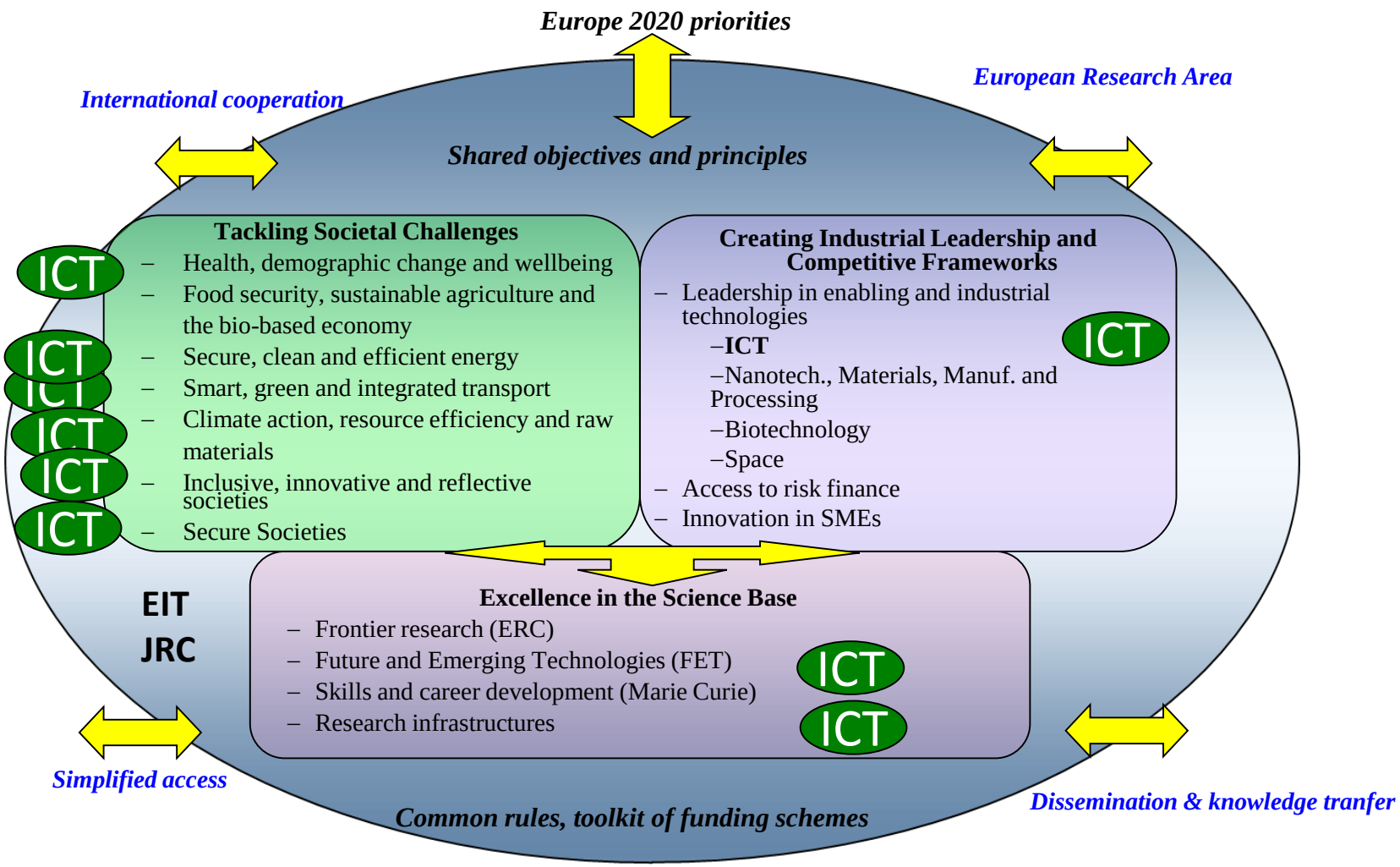
- Working with international standardisation bodies (ITU, ETSI, IEC, …)
- Working with industry stakeholders

Completing and expanding efforts to a common framework to capture ICT's overall impact across environmental dimensions

Application to Cities

- Cities' infrastructures cover whole potential of smart green ICT use:
  - Buldings, Neighbourhoods
  - Energy grids
  - Water
  - Transport, Logicstics
- Cities provide sufficient demand to achieve critical mass

To be able to compare and learn cities require own framework to measure ICT's impact


Europe 2020 priorities
International cooperation
European Research Area
Shared objectives and principles
Tackling Societal Challenges
– Health, demographic change and wellbeing
– Food security, sustainable agriculture and the bio-based economy
– Secure, clean and efficient energy
– Smart, green and integrated transport
– Climate action, resource efficiency and raw materials
– Inclusive, innovative and reflective societies
– Secure Societies
ICT
ICT
ICT
ICT
ICT
ICT
Creating Industrial Leadership and Competitive Frameworks
– Leadership in enabling and industrial technologies
–ICT
–Nanotech., Materials, Manuf. and Processing
–Biotechnology
–Space
– Access to risk finance
– Innovation in SMEs
ICT
EIT
JRC
Excellence in the Science Base
– Frontier research (ERC)
– Future and Emerging Technologies (FET)
– Skills and career development (Marie Curie)
– Research infrastructures
ICT
ICT
Simplified access
Common rules, toolkit of funding schemes
Dissemination & knowledge tranfer

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Societal Challenge 3: Secure, clean and efficient energy

ENERGY EFFICIENCY

- Buildings and consumers
- Heating and cooling
- Industry and products
- Finance for sustainable energy

COMPETITIVE LOW CARBON ENERGY

- Renewable electricity and heating/cooling
- Modernising the European electricity grid
- Providing the energy system with flexibility through enhanced energy storage technologies
- Sustainable biofuels and alternative fuels for the European transport fuel mix
- Enabling the decarbonisation of the use of fossil fuels during the transition to a low-carbon economy
- Supporting the development of a European research area in the field of energy
- Social, environmental and economic aspects of the energy system
- Cross-cutting issues

SMART CITIES AND COMMUNITIES

- Enhancing the roll-out of Smart Cities and Communities solutions by stimulating the market demand

ICT for energy efficiency in WP2014/15 Energy Efficiency – Market Uptake

EE11

New ICT-based solutions for energy efficiency

http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2063-ee-11-2014.html

EE8

Public Procurement of Innovative Sustainable Energy Solutions

http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2358-ee-08-2014.html

New ICT based solutions for energy efficiency

Specific Challenge

- To motivate & support citizen's behavioural change for achieving increased energy efficiency through ICT (in particular gaming and social networking)

  - ✓ while ensuring that:

energy savings from new ICT solutions > cost for providing services

New ICT based solutions for energy efficiency

Scope

1.- Service and Applications making use of information generated by energy consumers (e.g. through social networks) or captured by sensors (smart meters, smart plugs)

2.- From Apps for smart phones and tablets to serious games to stimulate consumer's participation into the energy market

3.- The proposed solutions should be deployed and validated in real life conditions in publicly owned buildings (including administrative offices, social housing) and buildings in public use or of public interest.

4.- Validation should provide socio-economic evidence for ICT investment in the field and include detailed plans for sustainability and large-scale uptake beyond the project's life time

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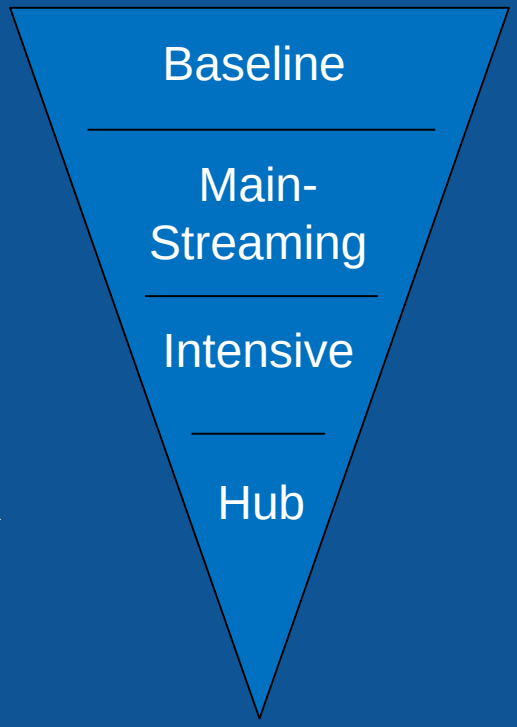
Responsible Research and Innovation (RRI) & Socio-Economic Sciences and Humanities (SSH): An Organic Approach

- **RRI actions & SSH expertise are called for as a baseline in Excellent Science, Industrial Leadership, and Societal Challenges**
- **RRI & SSH - explicitly called for in numerous topics, including energy efficiency**
- **EE 11 – Mainstreaming, embedded**
- **Motivate & support change of consumers' behaviour, increase consumer understanding & engagement in energy efficiency**
- **Consumers' involvement & empowerment**
- **Socio-economic analysis/evidence for ICT investment, plans for sustainability, uptake**



New ICT based solutions for energy efficiency

Expected impact

- Systemic energy consumption and production and emissions reduction between 15% and 30%.
- Accelerate wide deployment of innovative ICT solutions for energy efficiency.
- Greater consumer understanding and engagement in energy efficiency.

New ICT based solutions for energy efficiency

- **Type of action: Research & Innovation Actions**
- **Indicative budget distribution:**
  - **8,5 M€ in 2014 and EUR 8,5 M€ in 2015**
- **Contribution from the EU ranging from 1.5 to 2M€**
- **Date of publication: 11 December 2013**
- **Call deadline: 05 June 2014**

EE8 - Public procurement of innovative sustainable energy solutions

Specific Challenge

- Considering the **large volume** of **public spending** (19% of EU GDP, or roughly **EUR 2,200 bn in 2009**), the **public sector** constitute an **important driver** to stimulate **market transformation** towards more **sustainable energy products, buildings and services**.
- However, there are many **operational barriers** related to sustainable energy public spending such as:
    - **the lack of knowledge, practical training and tailored guidelines**;
    - **the lack of willingness to change procurement habits**
    - **or perceived legal uncertainties.**

EE8 - Public procurement of innovative sustainable energy solutions

Scope

- **Support public authorities in procuring fast-evolving information and communication technologies** such as Green Data Centres.
- Project proposals should **consider the risks associated to:**
  - **rapid technological evolution**,
  - **scalability**
  - and the **need for tailored** (i.e. not off the shelf) **solutions** by suppliers.
- Activities to support **networking of public procurers** or the use of **PPI** (Public Procurement of Innovative solutions) or **PCP** (Pre-commercial Procurement) are to be included

EE8 - Public procurement of innovative sustainable energy solutions

Expected impact:

- Every **million Euro of EU support** is expected to trigger the launch of public tenders for the purchase of sustainable energy products, buildings or services resulting in **savings of more than 25 GWh per year** of energy savings and/or renewable energy production. Proposals should also **increase**
    - **the skills of public procurers**
    - and the **market uptake of innovative solutions.**

Budget:

- The Commission considers that proposals requesting a **contribution from** the **EU** of between **EUR 1 and 1.5 million** would allow this specific challenge to be addressed appropriately. Nonetheless, this **does not preclude** submission and selection of proposals **requesting other amounts.**

EE8 - Public procurement of innovative sustainable energy solutions

- **Type of action: Coordination and Support Action**
- **Indicative budget : 1-1,5 M€ in 2014**
- **Date of publication: 11 December 2013**
- **Call deadline: 05 June 2014**

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Thank you for your attention!

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