

LIFE Climate CAKE PL project

System of providing and disseminating information
in order to support the strategic implementation of climate
policy

10th December 2018 / 9:00 – 10:00

PCCB Capacity-Building Hub / RYSY Meeting Room 24 - Area E



THE NATIONAL CENTRE FOR EMISSIONS MANAGEMENT KOBIZE

- ▶ **KOBiZE** as a part of Institute of Environmental Protection – National Research Institute (IOS - PIB) is responsible for emissions management and administration of EU ETS in Poland under the supervision of the Ministry of Environment.
- ▶ **Administration of the EU ETS:**
 - ▶ Allocation of free allowances
 - ▶ Monitoring and verification
 - ▶ Reports related to the system
 - ▶ Administration of EU Registry
 - ▶ Auctions
- ▶ **Management of national emissions:**
 - ▶ Database with information on the emitters (not only GHG)
 - ▶ Reporting under UNFCCC and other conventions
 - ▶ Active negotiators within UNFCCC process (COP)



OUTLINE

- ▶ Our way towards LIFE Climate CAKE PL Background and CAK project
- ▶ Description of the LIFE Climate CAKE PL project
- ▶ Analytical tools
- ▶ Research questions and analyses
- ▶ Stakeholders involvement
- ▶ Dissemination and replicability
- ▶ Contribution to capacity building

OUR WAY TOWARDS **LIFE CLIMATE CAKE PL**

CENTRE FOR CLIMATE ANALYSIS CAK (CENTRUM ANALIZ KLIMATYCZNYCH)

2013 - 2015

CENTRE FOR CLIMATE ANALYSIS (CAK) – THE PROJECT

- ▶ **Intra-governmental agreement** from May 2013 – Ministry of Finance, Ministry of Economy & Ministry of Environment + World Bank financial, know-how and logistics support
- ▶ Construction and development of **global CGE model PLACE**
- ▶ **Steering Committee** – involvement of policy makers from central administration
- ▶ Several **workshops** were conducted with: European Commission (PACE model), PIK Potsdam, IDDRI, CPB Netherlands, The World Bank, IEA

CENTRE FOR CLIMATE ANALYSIS (CAK) – OUTCOMES

- ▶ Main **research papers and reports**:
 - ▶ *Economic effects of the proposed 2030 climate and energy policy framework on Poland and other EU regions*
 - ▶ *Sharing the burden of the EU climate and energy policy 2030: an economic impact assessment for the EU Member States*
 - ▶ *Macroeconomic impacts of alternative options concerning use of revenues from the auctioning emission allowances considering mechanism adopted in EC Conclusions of 2014*
- ▶ Results used to **improve domestic policy** as well as by Poland's representatives in **intra-EU negotiations**
- ▶ **Skilled experts**
- ▶ **Improved communication with stakeholders and networking**

LIFE CLIMATE CAKE PL

DESCRIPTION OF THE PROJECT

2016 -

LIFE CLIMATE CAKE PL - BRIEF INFORMATION

- ▶ **NAME:** Building a system of providing and disseminating information supporting the implementation of the EU's climate and energy policy
- ▶ **PROJECT LOCATION:** Warsaw, Poland
- ▶ **PROJECT IMPLEMENTER:** Institute of Environmental Protection / National Research Institute - National Centre for Emissions Management
- ▶ **DURATION:** 01/09/17 – 30/11/20
- ▶ **BUDGET:** 2,4 m euro

RATIONALE FOR THE PROJECT (1)

- ▶ **Domestic perspective:**
 - ▶ Significance of the comprehensive and reliable information in decision-making (availability, adequacy, quality)
 - ▶ Expectations of stakeholders, especially those involved in climate policy development and implementation
 - ▶ Using the current potential of knowledge and experience
- ▶ **European and international perspective:**
 - ▶ Increasing ambition level and the need to speed up actions
 - ▶ Insufficient consideration of country-specific impacts

RATIONALE FOR THE PROJECT (2)

▶ Analytical challenge

- ▶ Deficiency or inadequacy of analytical tools (lack of coherent and comprehensive analytical toolkit for different areas of climate & energy policy)
- ▶ Lack of transparency of modelling tools: models construction and assumptions, models development and data quality information, etc.
- ▶ Lack of effective communication of modelling results between modellers and policymakers

▶ Obligation to apply modelling tools

▶ UNFCCC level

- ▶ **„Annex I parties prepare emissions estimates using models assumptions”**
Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II, par. 50(a)

▶ EU level

- ▶ National Climate & Energy plans and emissions projections **„Those projections and assessments should include descriptions of the models and methodological approaches used, definitions and underlying assumptions”**
Regulation Governance of the Energy Union and Climate Action, art. 16

CAKE - WHY THIS PROJECT WAS NEEDED?

- ▶ Problem targeted – need for the **GHG & other pollutants** emissions reduction
- ▶ Problem recognized widely at international, European & country level
- ▶ Differences in the **level of awareness** of the scale of climate change among emitters, decision-makers, general public
- ▶ Need for a in-depth analysis of the effects of the **climate & energy** policies and measures at the country, European and international level
- ▶ Challenge to develop and implement **effective** and **fair** policies which would stimulate emissions reductions at the country and EU level
- ▶ Lack of appropriate & transparent **modelling tools**, which could support decision making and regulatory process.

IMPORTANT QUESTIONS

- ▶ How to assure effective use of modelling results for **policy making** in climate & energy area?
- ▶ How to achieve good communication of modelling results between modellers and **policymakers/stakeholders**?

LIFE CLIMATE CAKE PL – THE CONCEPT

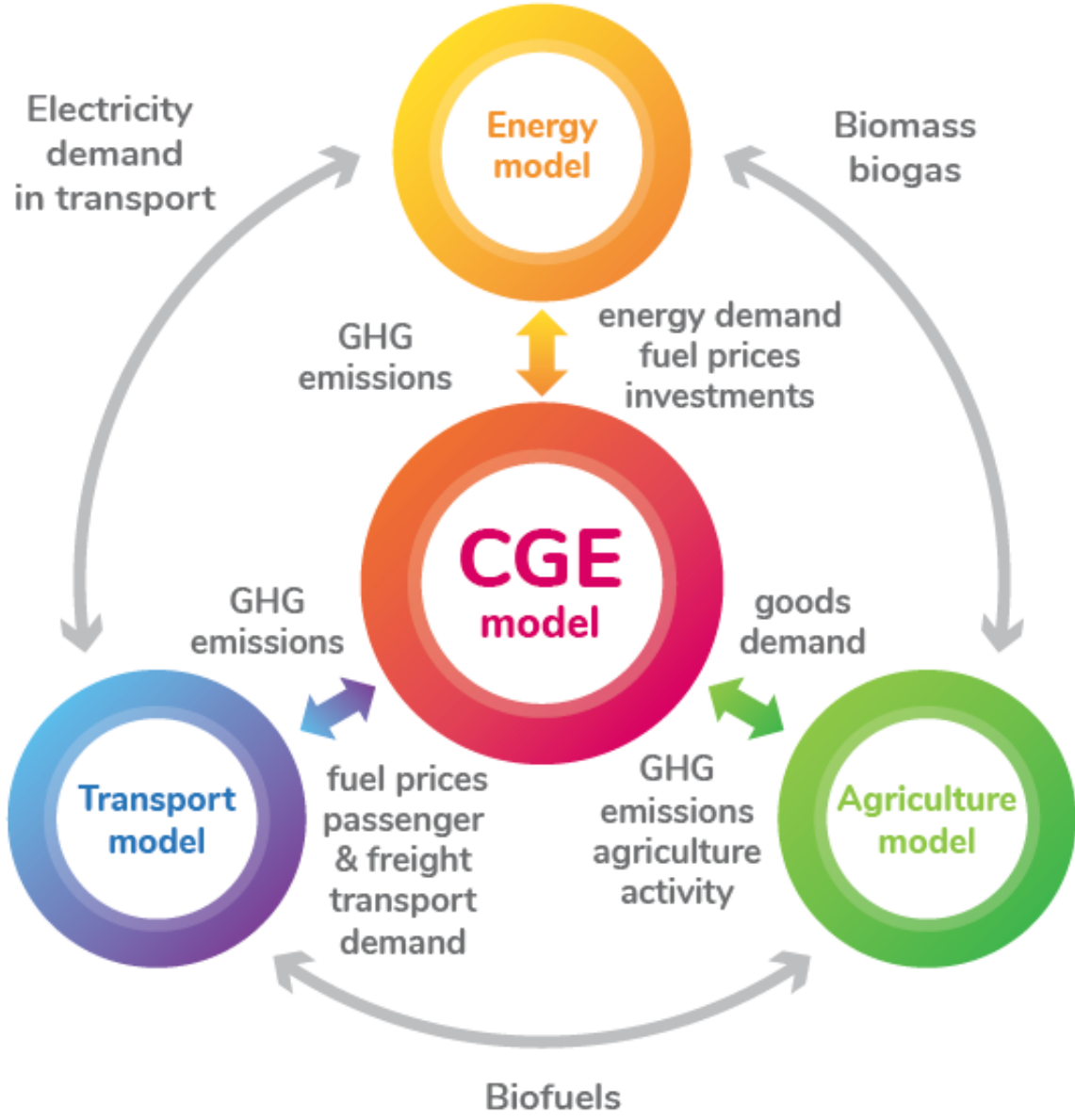


LIFE CLIMATE CAKE PL - To CONCLUDE...

- ▶ The main objective is to develop a **sustainable and comprehensive system** for creating and exchanging information and knowledge in order to support the effective and efficient implementation of the EU climate and energy policies.
- ▶ Building a comprehensive and consistent **toolkit**, including CGE and sectoral models, to assess policy impacts and support policy stakeholders.
- ▶ Supporting the decision-making process and increasing the potential of knowledge.
- ▶ Establishing Centre for Climate and Energy Analyses (**CAKE**) to secure project sustainability.
- ▶ As part of the project, the **Steering Committee** and the Technical Group have been established, which include representatives of the **target group** cooperating with the project team.

ANALYTICAL TOOL-KIT

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▶ CGE model PLACE

- ▶ **Global** coverage and multisectoral approach (35 regions and 20 sectors)
- ▶ Recursive dynamic model
- ▶ Time horizon – 2050
- ▶ Extended modelling of energy sector and GHG emissions
- ▶ Comprehensive coverage of policy impacts (welfare cost of policies)
- ▶ More complex modelling the emission trade
- ▶ CO2 and non-CO2 emissions included
- ▶ **Linking to sectoral models**

MODEL DESCRIPTION – ENERGY

- ▶ The **main objective** is to develop energy model as a tool supporting the CGE model with more detailed description of European energy system, to assess the impact of the EU climate and energy policies
- ▶ **Features**
 - ▶ Regional coverage – EU 28
 - ▶ Time horizon – 2050
 - ▶ EU energy system representation, cross border exchange
 - ▶ CO2 emissions
 - ▶ Renewables, nuclear and conventional sources
- ▶ Standalone energy model will be also used for **complex analysis** of specific policies **in energy sector** (emission reduction targets, renewable sources, cogeneration)

MODEL DESCRIPTION – TRANSPORT

- ▶ Regional coverage – EU-28
- ▶ Time horizon – 2050
- ▶ Road and rail transport – passenger and freight
- ▶ Age structure of stock, new vehicles and new technologies (low emission cars)
- ▶ Outcomes:
 - ▶ activity level,
 - ▶ stock of vehicles,
 - ▶ energy consumption,
 - ▶ CO2 emissions.

MODELS DESCRIPTION - AGRICULTURE

- ▶ Regional coverage – PL
- ▶ Three elements:
 - ▶ farm sub-model
 - ▶ farm structure sub-model
 - ▶ market sub-model
- ▶ Possible outcome:
 - ▶ Policies limiting GHG emissions, such as:
 - changes in size and structure of domestic agricultural production,
 - changes in intermediate consumption and demand for labour,
 - ▶ Impacts of the EU and domestic agricultural and climate policies.

POLICY AND RESEARCH QUESTIONS AND ANALYSES

POLICY AND RESEARCH QUESTIONS TO BE ANALYSED (1)

- ▶ Developing the low-carbon pathway for GHG emission reduction in sectors: energy, transport and agriculture.
- ▶ Adequate national strategies to optimize reductions burden – to maximize reductions with given costs (what effectively means to make decarbonisation feasible).
- ▶ Optimizing reduction efforts in non-ETS sectors to improve effectiveness of achieving 2030 policy targets;
- ▶ Efficient application of available allocation mechanisms in energy sector to stimulate energy decarbonisation.
- ▶ Long-term strategies for energy sector development, including energy-mix and energy safety.

POLICY AND RESEARCH QUESTIONS TO BE ANALYSED (2)

- ▶ Projecting the response of transport sector to different policies (considering main factors e.g.: changes in the stock of vehicles, electric vehicles development, behavioural changes).
- ▶ System costs of different decarbonisation scenarios/policies.
- ▶ Costs of carbon reduction in agriculture sectors/subsectors by scenario. Designing optimal reduction pathway.
- ▶ Costs of carbon reduction in transport sectors/subsectors by scenario. Designing optimal reduction pathway and policy mix to support electro mobility.
- ▶ Identifying drivers and channels of different sources of carbon leakage to support policies that are aimed at preventing the leakage (e.g. border tax adjustment or support for technology transfers).

EXAMPLE: LINKING THE MODELS - ENERGY

- ▶ Linking the CGE model to energy models is very popular in the EU and linked CGE-energy models are standard workhorse tool for analysing the impact of changes in energy sector on the economy, such as:
 - ▶ TIMES energy model + CGE (Helgesen, 2014) to e.g. design optimal energy mix
 - ▶ PRIMES energy model + GEM E3 (CGE model), by Capros and EC
 - ▶ Many academics work, such as seminal paper Böhringer&Rutheford (2008) and work of followers.
- ▶ Such models can be used to:
 - ▶ Analyse the impact of changes in carbon policies on energy mix, but to very detailed extent, even showing specific installations.
 - ▶ Analyse the impact of very specific carbon policies (e.g. discretionary changes to policy mix) on the GDP, carbon emission, production structure of the agriculture sector etc.
- ▶ The topic of linkages and integration of CGE/partial equilibrium energy models is very hot in modern CGE/climate literature.

EXAMPLE: LINKING THE MODELS - AGRICULTURE

- ▶ The are few examples of linking CGE model with agriculture model, such as:
 - ▶ Partial equilibrium model CAPRI with CGE model MAGNET (Phillippidis et al., 2017);
 - ▶ Partial equilibrium model CAPRI with CGE model GTAP (Jansson et al., 2009).
- ▶ Such models can be used to:
 - ▶ Analyse the impact of reductions on e.g. farm structure, price of different agriculture outputs etc.
 - ▶ Analyse the impact of very specific changes in energy sector on the GDP, emissions, competitiveness etc.

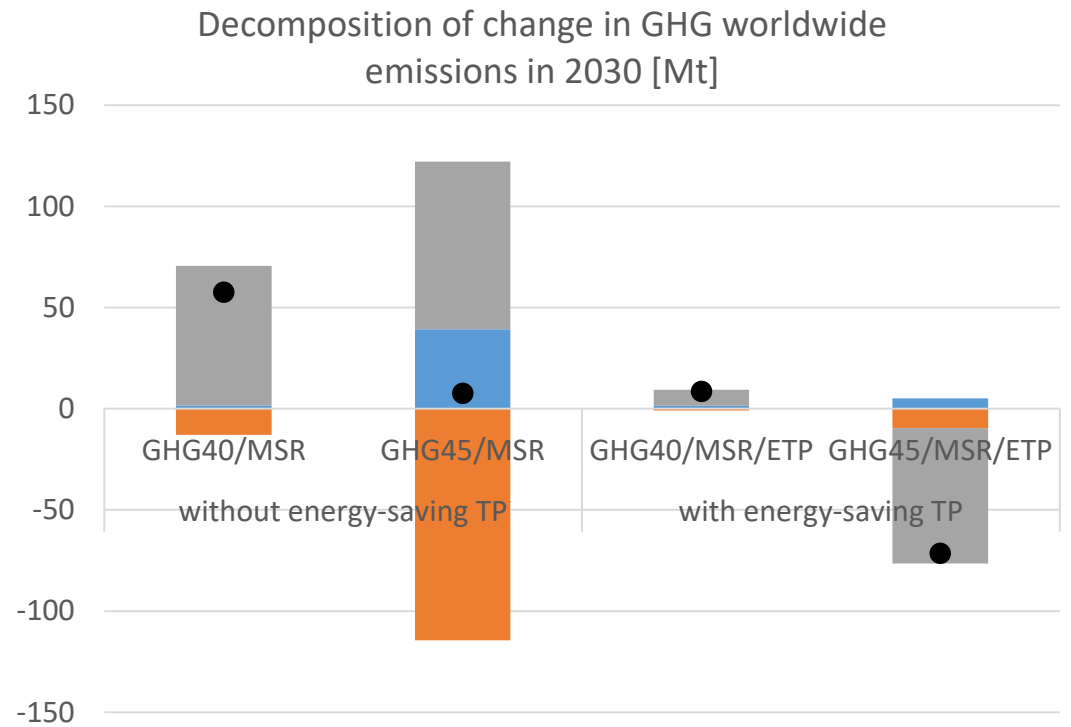
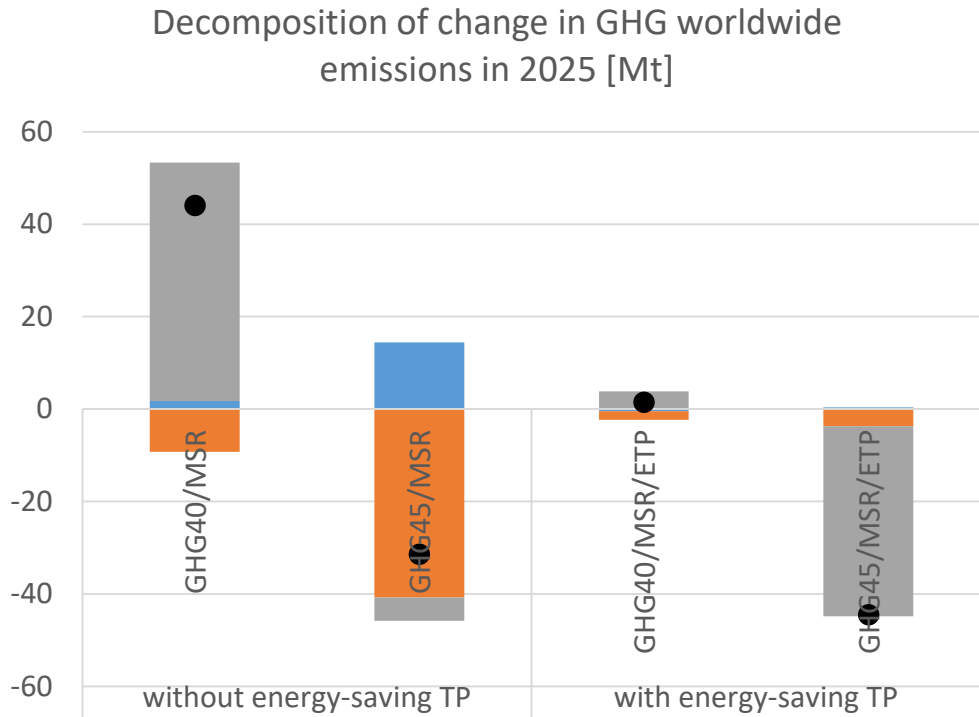
EXAMPLE: LINKING THE MODELS - TRANSPORT

- ▶ Linking CGE model to transport model is little less common than in case of energy or agriculture.
- ▶ There are following examples:
 - ▶ PRIMES-TREMOVE that is linked to GEM-E3 (NTUA + E3MLab), financed by EC
 - ▶ MIT-EPPA model, developed in MIT by S. Paltsev (e.g. 2016)
- ▶ Such models can be used to:
 - ▶ Analyse the impact of reductions on the transport sector, transport choices, evolution of fleet etc.
 - ▶ Analyse the effects of very specific transport policies (e.g. support for electro mobility) on the consumption, investment GDP etc.

EXAMPLE: CARBON LEAKAGE ANALYSIS

- ▶ In carbon leakage analysis, we aim to analyse the impact of MSR & tightening reduction target in EU.
- ▶ We DO NOT assess the scale of carbon leakage as such, because it depends to a large extent on the actions of the rest of the world.
- ▶ Instead, we identify channels of carbon leakage to design an optimal policy mix to prevent carbon leakage.
- ▶ Also, we show the impact of the assumptions on the result and how important they are in shaping final conclusions.

EXAMPLE: CARBON LEAKAGE ANALYSIS



■ Competitiveness channel ■ Demand channel ■ CI channel ● Total

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- ▶ Carbon intensity channel is the most important channel of carbon leakage.
- ▶ The key driving factors are change in sectoral structure and in the energy mix.
- ▶ Changes in output or trade balance (i.e. through competitiveness channel) plays less important role.

EXAMPLE: CARBON LEAKAGE PRELIMINARY RESULTS

- ▶ First, carbon leakage should be perceived as an important problem that can limit the effectiveness of EU ETS (including MSR).
- ▶ Our assumption of „no external emission reduction target” is used as an example to show the potential problem scale. Adoption of more stringent policies in the EU will create incentives for other countries to relax their own emission reduction commitments.
- ▶ Differences in production structure and sector carbon intensity contribute to carbon leakage to a similar extent. Therefore, we should tackle both energy mix channels (e.g. by promoting fuel efficient technologies) and sectoral structure channel (e.g. through free allocation or border tax adjustment).
- ▶ Accounting for „*energy-saving technical progress*” greatly reduces the risk of carbon leakage. Therefore, it is very important to support research on energy-efficient technologies and make them available also to Rest of World.

STAKEHOLDERS INVOLVEMENT

REFLECTION ON COMMUNICATION

- ▶ Since models are specific in their nature, output receivers not necessarily understand results
- ▶ Decision-makers / public officers prefer simple, specific numbers to make decisions as well as to communicate them to the public
- ▶ Models and other analyses provide partial outlook, while communication to the public must be comprehensive (including broader and cross-cutting perspective)
- ▶ Evaluation criteria should be addressed as well. Key decision/policy evaluation criteria include:
 - ▶ effectiveness
 - ▶ efficiency
 - ▶ proportionality

LIFE CLIMATE CAKE PL - STAKEHOLDERS

- ▶ **The project is addressed to the central administration** (the Ministry of the Environment, the Ministry of Energy, the Ministry of Finance, the Ministry of Economic Development, the Ministry of Agriculture and Rural Development, the Ministry of Infrastructure and Construction, the Ministry of Foreign Affairs, the Chancellery of the Prime Minister), which is responsible for creating climate and energy policies
- ▶ **The main users (apart from the central administration) of the results of analyses and assessments carried out as part of the project are:**
 - ▶ Sectoral organisations
 - ▶ Non-governmental organisations
 - ▶ Local administration
 - ▶ Universities and research centres
- ▶ The Project aims to better communication of modelling assumptions and results through the meetings of **Steering Committee** and the **Technical Group**

STEERING COMMITTEE AND TECHNICAL GROUP

- ▶ The Steering Committee and the Technical Group have been established as part of the project, involving representatives of the target group (ministries)
- ▶ The goal is to engage the target group into the project implementation to achieve the highest possible cohesion and usefulness of project output with expectations addressed
- ▶ Meetings of SC and TG – place for exchange of information in purpose of:
 - ▶ Evaluation of specific needs of the target group,
 - ▶ Identifications of problems and shortcomings,
 - ▶ Future works, reports, meetings,
 - ▶ Communicating and learning the project results understanding and use.

DISSEMINATION, REPLICABILITY, SUSTAINABILITY

DISSEMINATION & REPLICABILITY

- ▶ Long-lasting identification of stakeholders
- ▶ All possible channels
 - ▶ Project website (information, products)
 - ▶ Workshops and seminars
 - ▶ Networking
 - ▶ Cooperation
- ▶ Updating
- ▶ Transparency
- ▶ Adequate modifications of the tool-kit to extend possible applications

SUSTAINABILITY

- ▶ Developing skills, expertise and experience
- ▶ The team of skilled experts
- ▶ Integrated and comprehensive analytical tool-kit
- ▶ Institutional arrangements (CAKE)
- ▶ Long-lasting identification of partners and co-operators
- ▶ Identification and better recognition of needs – increasing awareness
- ▶ Exploring possibilities for funding replication
- ▶ Potential to extend the scope of analytical goals

LIFE CLIMATE CAKE PL

- CONTRIBUTION TO CAPACITY BUILDING

CAPACITY BUILDING - OUR UNDERSTANDING

- ▶ **Knowledge**
- ▶ **People**
- ▶ **Tools**
- ▶ **Involvement**
- ▶ **Channels**
- ▶ **Levels**
- ▶ **Comprehensive approach**

CAPACITY BUILDING - OUR CONTRIBUTION (1)

▶ Knowledge

- ▶ Producing knowledge
- ▶ Focus on adequacy, reliability, quality

▶ People

- ▶ Highly skilled experts – make analyses and share experience
- ▶ Identification of stakeholders to improve addressing
- ▶ Openness and networking
- ▶ Assistance

CAPACITY BUILDING - OUR CONTRIBUTION (2)

▶ **Tools**

- ▶ Adequate
- ▶ Useful
- ▶ Applicable
- ▶ High quality

▶ **Involvement**

- ▶ Cooperation with stakeholders
- ▶ Engagement in operations
- ▶ Identifying challenges and needs

CAPACITY BUILDING - OUR CONTRIBUTION (3)

- ▶ **Channels**
 - ▶ Active development
 - ▶ Maximizing dissemination
 - ▶ Diversity
 - ▶ Effectiveness and efficiency
- ▶ **Levels**
 - ▶ International, national, local
- ▶ **Comprehensive approach**
 - ▶ Building a system



Centre for Climate
and Energy Analyses



Thank you!

LIFE Climate CAKE PL Team

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