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ENERGIA

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ACTIVITY ENERGY.2: RENEWABLE ELECTRICITY GENERATION

- Areas **open** under TREN 2007 call
 - ➔ AREA ENERGY.2.1 : **PHOTOVOLTAICS**
 - ➔ AREA ENERGY.2.2 : **BIOMASS**
 - ➔ AREA ENERGY.2.3 : **WIND**
 - ➔ AREA ENERGY.2.5 : **CONCENTRATED SOLAR POWER**

- Areas **not open** under TREN 2007 call
 - ➔ AREA ENERGY.2.4 : **Geothermal**
 - ➔ AREA ENERGY.2.6 : **Ocean**
 - ➔ AREA ENERGY.2.7 : **Hydro**

PHOTOVOLTAICS Topics for 2007 (1/3)

- **2.1.7 Secure, reliable and affordable supply of feedstock for the PV industry (CSA)**
 - ➔ Objective is ensure a secure, reliable and affordable supply of Si feedstock
 - ➔ Facilitate demand from PV industry to meet the supply side by setting-up actions to properly kick-start new and efficient routes
- **2.1.8 Improved production equipment and cost reduction (CP - mainly DEMO)**
 - ➔ Objective is the cost reduction of the production equipment used by the PV manufacturing industry
 - ➔ Development and demonstration of new equipment to be put on the market. Cost, efficiency and environmental aspects should be taken in consideration



PHOTOVOLTAICS Topics for 2007 (2/3)

- **2.1.9 Innovative/improved PV manufacturing processes (CP- mainly Demo)**

- ➔ Objective is develop and demonstrate innovative processes in PV manufacturing industry to increase yield and reduce costs

- **2.1.10 Development and demonstration of standard building components (CP - mainly Demo)**

- ➔ Objective is develop and demonstrate standardized and tested building components based on photovoltaics, complying with existing standards and building codes
- ➔ Building industry should lead the initiative



PHOTOVOLTAICS Topics for 2007

● 2.1.11 Multiple benefits of PV systems (CP-mainly Demo)

- ➔ Objective is demonstrate multiple benefits of PV systems to increase PV electricity value
- ➔ Power quality improvement in industrial and residential environment
- ➔ Security of supply in residential and urban environment and autonomous supply systems in NMS and DCs



BIOMASS Topics for 2007 (1/3)

● 2.2.4: Large-scale co-firing (CP - mainly DEMO)

- ➔ Demonstration of co-firing of biomass in existing large-scale fossil fuel fired power plant with high net electric efficiency and high biomass share
- ➔ Long term monitoring of sustainability and reliability of feedstock supply and of the co-firing impact on power plant performance, such as flue gas cleaning systems, ash usability, plant availability
- ➔ Topic is open to all co-firing concepts and biomass feedstocks

BIOMASS Topics for 2007 (2/3)

● 2.2.5: Novel solid biofuels for electricity generation (CP - mainly DEMO)

- Demonstration of production of new, tradable solid biofuels fully or partially based on unconventional and difficult resources (e.g. straw and/or organic wastes) including long-term application in existing bio-electricity installations
- Ready-to-use new biofuels without necessity of major technical adaptations of existing conversion plants
- Supplementary pre-normative work aiming at a future European-wide standardisation of these new biofuels is welcome

BIOMASS Topics for 2007 (3/3)

- **2.2.6: High-efficiency medium-to-large scale electricity generation from biomass (CP - mainly DEMO)**
 - ➔ Demonstration of medium- to large scale power generation from biomass with increased net electric efficiency, high process reliability at levels which are competitive with those of fossil fuel based power generation, and low pollutant emissions
 - ➔ Such installations may have to be able to run on biomass feedstock of varying origin and quality
 - ➔ Topic is open to all conversion technologies (combustion, gasification etc.) and all biomass feedstock

WIND Topics for 2007 (1/2)

- **2.3.4 Demonstration of large scale systems for on and off-shore wind farms (CP - mainly DEMO)**
 - ➔ Multi MW-turbines, tower and foundation, electrical conversion system, wind farm, interface with grid, integrated storage
 - To be addressed: logistics, manufacturing and maintenance strategies, incl. socio-economic and environmental issues

- **2.3.5 Integration of wind power into the European power system (CP- mainly DEMO)**
 - ➔ Design and operating principles for cost effective large scale grid integration of systems
 - To be addressed: electric/electronic components and technologies for grid connection and operation



WIND Topics for 2007 (2/2)

- **2.3.6 Wind mapping for off-shore applications (CP - mainly DEMO)**

- Cost effective tools and methods aiming at offering maximum availability of comprehensive off-shore wind data

To be addressed: advanced support tools, databases and services

CONCENTRATED SOLAR POWER

Topics for 2007 (1/2)

- **2.5.3 Low cost, high efficiency daily storage systems (CP - mainly DEMO)**
 - ➔ Objective is develop and demonstrate cost-effective storage systems to extent electricity production during and between the solar radiation hours
 - ➔ improve the overall economics of the generation facility

- **2.5.4 Improve the environmental profile of the CSP installations (CP - mainly DEMO)**
 - ➔ Objective is improve the environmental profile of the CSP installations to allow their larger exploitation
 - ➔ Reduction of water usage for the thermodynamic cycle by more economic and sustainable solutions and a more efficient land utilization.



CONCENTRATED SOLAR POWER

Topics for 2007 (2/2)

- **2.5.5 Innovative heat transfer concepts (CP - mainly DEMO)**
 - ➔ Objective is improve performances of heat transfer cycle by extending the temperature operating range
 - ➔ Achieve better integration and/or more efficient and economic operation conditions, increasing production during the solar radiation hours and reducing the kWh cost
- **2.5.6 Intermediate size, lower concentratio ratio CSP systems (CP - mainly DEMO)**
 - ➔ Objective is demonstrate smaller size CSP systems (0,1 MW to 1MW-2MW) for producing electricity heat and cooling in distributed production schemes
 - ➔ Lower cost of the installed power in the range from 1000 €/kW to 2000 €/kW



ACTIVITY ENERGY 3 (TREN): RENEWABLE FUEL PRODUCTION

- **Areas open under TREN 2007 call**
 - AREA ENERGY.3.1 : 1st GENERATION BIOFUELS PRODUCTION
 - AREA ENERGY.3.2 : 2nd GENERATION BIOFUELS PRODUCTION
 - AREA ENERGY.3.6 : BIOFUELS USE IN TRANSPORT
 - AREA ENERGY.3.7 : CROSS-CUTTING ISSUES

- **Areas not open under TREN 2007 call**
 - AREA ENERGY 3.5 : BIOREFINERIES
 - AREA ENERGY : NEW ENERGY CROPS

 - AREA ENERGY.3.1 : Topic Biomethane
 - AREA ENERGY 3.2 : Topic Ethanol from lignocellulosics



3.1 - 1st GENERATION BIOFUELS PRODUCTION

● 3.1.1 Bioethanol from sugar & starch crops (CP- mainly DEMO)

- Objective is to demonstrate the production of bioethanol with energetic utilisation of the process by-products aiming to reduce the cost of European based bioethanol production to comparable international levels
- Projects should be at industrial scale
- Aiming to demonstrate improved overall efficiencies, and,
- Maximising the use of natural resources



3.1 - 1st GENERATION BIOFUELS PRODUCTION

- **3.1.2 Biodiesel from oil crops, animal tallow & used cooking oils (CP- mainly DEMO)**
- Objective is to demonstrate the production of biodiesel with energetic utilisation of the process by-products aiming to reduce the costs. Projects can also address:
 - ◆ Fatty acid ethyl ester production
 - ◆ Glycerol use in stationary applications
- ➔ Projects should be at industrial scale
- ➔ Aiming to demonstrate improved overall efficiencies, and,
- ➔ Maximising the use of natural resources



3.2 - 2nd GENERATION BIOFUELS PRODUCTION

3.2.5 Synthetic Biofuels via gasification (CP- mainly DEMO)

- Objective is to demonstrate the production of synthetic biofuels from biomass (and process by-products such as black liquor & flash pyrolysis oils). Projects may address the following:
 - ◆ Biofuels: Fischer-Tropsch, DME, methanol, ethanol of biomethane
 - ◆ Testing of the fuels in appropriate engines, vehicles or captive fleets
 - ◆ Testing in CHP applications or H₂ production
 - ◆ Development of standards in coordination with CEN
- Aiming to demonstrate improved overall efficiencies, and,
- Projects should aim for industrial scale
- Maximising the use of natural resources



3.2 2nd GENERATION BIOFUELS PRODUCTION



3.2.6 Hydrogenation of oils and fats (CP- mainly DEMO)

- Objective is to demonstrate at industrial scale the hydrogenation of oils and fats for the production of a diesel-type biofuel.
- Projects may address the following:
 - ◆ Testing of the diesel-type fuel in appropriate engines, vehicles or captive fleets
 - ◆ Testing in CHP or heating applications
 - ◆ Development of the supply chain of the biofuel in the market
- Aiming to demonstrate improved overall efficiencies, and,
- Projects should be at industrial scale
- Maximising the use of natural resources



AREA ENERGY 3.6 (TREN): BIOFUELS USE IN TRANSPORT

- **3.6.1 Demonstration of liquid and gaseous biofuels use in transport/vehicles**

(Medium scale fleets demonstration)

Pure biofuels, High blends, Biofuels electric hybrid vehicles

Biofuels from innovative production processes and innovative ways of use will be considered more valuable

A reduced number of projects will be funded.



3.7: CROSS-CUTTING ISSUES

3.7.4 Promotion & dissemination (SA)

- Objective is to facilitate the smooth penetration of the biofuels (solid, liquid & gaseous) in the market and improve their public acceptance.
- Activities may address promotion campaigns, dissemination of experiences and results from successful projects as well as educational activities.
- Projects need to demonstrate a European approach and dimension.
- Projects should be in coherence with the Intelligent Energy Europe programme.



ACTIVITY ENERGY.4: RENEWABLES FOR HEATING & COOLING

- Areas **open** under TREN 2007 call :

- AREA ENERGY.4.1 : **SOLAR THERMAL LOW-MEDIUM TEMPERATURE**

- AREA ENERGY.4.3 : **GEOTHERMAL ENERGY**

- AREA ENERGY.4.4 : **CROSS-CUTTING ISSUES**

- Areas **not open** under TREN 2007 call :

- AREA ENERGY.4.2 : **BIOMASS**



AREA ENERGY.4.1: SOLAR THERMAL LOW-MEDIUM TEMPERATURE

● 4.1.1 Collector design & components

- Consider openly types of collectors (flat plate, evacuated tubes, parabolic troughs, ...) for Hot water/ space heating, industrial process heat, water desalination
- Some main Technological challenges:
 - ◆ Improve absorption efficiencies,
 - ◆ Develop new cost effective optical coatings, new self cleaning- glazing materials
 - ◆ Substitute Glass, metals by Plastics
 - ◆ Ensure the right integration in the overall system (compactness – kit systems)



AREA ENERGY.4.1: SOLAR THERMAL LOW-MEDIUM TEMPERATURE

● 4.1.2 Small scale thermal cooling units

- Consider integrated systems at small scale capacity (range : below 10 kW) for domestic/ offices uses
- Main Technological challenges:
 - ◆ Improve absorption/adsorption process efficiencies at low temperatures
 - ◆ Develop compact systems/ devices (operation, maintenance & system monitoring)
 - ◆ Set up standards for these new devices



AREA ENERGY.4.1: SOLAR THERMAL LOW-MEDIUM TEMPERATURE

- **4.1.3 Small distributed systems for sea water desalination**
 - ➔ Consider Small- Medium size de-centralised processes
 - ➔ Main Technological challenges:
 - ◆ Develop high efficiency and reliable systems with technologies as membrane distillation, multi-stage stills under high constraining fluctuations of solar radiation.
 - ◆ Develop compact systems/ devices (operation, maintenance & system monitoring)
 - ◆ Set up standards for these new devices



AREA ENERGY.4.1: SOLAR THERMAL LOW-MEDIUM TEMPERATURE

- **4.1.4 Large scale systems for industrial heat processes**
 - ➔ Industrial solar thermal applications are under developed in the EU (some % of total heat demand). It needs strong support in order exploit huge potential
 - ➔ Main Technological challenges:
 - ◆ Develop- demonstrate high efficiency collectors (range 80 – 250 °C) and reliable integrated systems
 - ◆ Set up standards for these new devices



AREA ENERGY.4.3

GEO THERMAL ENERGY

- **4.3.1 Improved geothermal heat pumps (CP- mainly DEMO)**
 - ➔ Consider how to reduce total costs (investment, operation, maintenance) and extend usage in Europe, particularly in Mediterranean regions
 - ➔ Main Technological challenges:
 - ◆ Optimise component level design, including heat transfer fluids
 - ◆ Improve COP of heat pump and overall system
 - ◆ Reduce operating costs and pay-back time



AREA ENERGY.4.3

GEOHERMAL ENERGY

• 4.3.2 Improved underground systems (CP- mainly DEMO)

- ➔ Consider importance of underground components to improve reliability and market share
- ➔ Main Technological challenges:
 - ◆ Develop components easy to connect and disconnect from the surface
 - ◆ Improve robustness and reliability, reduce maintenance needs
 - ◆ Reduce installation and repair costs



AREA ENERGY.4.4: CROSS-CUTTING ISSUES

- **4.4.1 Advanced compact storage systems (CP- mainly DEMO)**
 - ➔ To develop - demonstrate high compact storage systems with higher E density than water (short term: factor 3-4) for heat- cooling applications
 - ➔ Support to Research on PCM and Thermochemical storage processes (eg: absorption/adsorption)

Activity 6

CLEAN COAL TECHNOLOGIES

- **Conversion Technologies for Zero Emission Power Generation**
 - Pulverised Fuel Combustion / USC
 - Integrated Coal Gasification Combined Cycles
 - Application of Fluidised Bed Technologies
- **Coal Based Poly Generation**
 - Conversion processes (liquefaction, gasification) coupled with CCS
 - Efficient conversion coupled with production of secondary energy carriers



CROSS CUTTING ACTIONS BETWEEN ACTIVITIES 5&6

- **Cross-Cutting and Regulatory Issues**
 - ➔ General economic, social, environmental and infrastructural development issues essential for large scale commercial deployment of CCS in coal-fired power plants
 - ➔ Recommendations to overcome non technical barriers for the deployment of CCS in coal-fired power plants
 - ➔ Contribute to the preparation of a regulatory framework for CCS Technology in Europe
 - ➔ Support international co-operation actions as well as non- community research activities



Topic 6.1.1: Solid Fuel Gasification Development

- **Aim**
 - ➔ Definition of a more robust, efficient and reliable coal gasification technology
 - ➔ Identification of most promising gasification technologies for subsequent CO₂ separation
- **Approach**
 - ➔ Comparative study with a view on fuel flexibility and zero emission power generation
 - ➔ Aspects to be taken into account (among others): variability of solid fuels, integration of gasification technology equipment, reliability and availability of technology
- **Type**
 - ➔ Collaborative Project



Topic 6.2.1: Polygeneration Concept for Coal Fired Power Plants

- **Aim**
 - ➔ Research, development and demonstration of advanced conversion technologies coupled with CO₂ capture and storage
 - ➔ Identification of pathways for secondary fuel generation
- **Approach**
 - ➔ Feasibility study with a view on implementation
 - ➔ Demonstration project as a follow up
- **Type**
 - ➔ Collaborative Project
 - ➔ Involvement of China desired (Coal-to-Liquid)

Topic 5&6.2.2: Support to Regulatory Activities for Zero Emission Power Generation

- **Aim**
 - ➔ Support the efficient and environmentally acceptable use of coal in power plants through an adequate regulatory framework
 - ➔ Thereby enabling coal to play its role in terms of energy supply security and diversification
- **Approach**
 - ➔ Support the Commission in drafting a regulatory framework for large scale deployment of ZEP
 - ➔ Support the Commission's initiatives in the follow-up to the communication on sustainable coal technologies for ZEP
- **Type**
 - ➔ Coordination and Support Action



Topic 5&6.2.4: Initiating a CO₂ value chain in the Energy Sector

- **Aim**
 - Development of a value chain for captured CO₂
- **Approach**
 - Studies, planning and simulation work for facilitating decision making processes for Enhanced Oil Recovery (EOR) and Enhanced Gas Recovery (EGR) via CO₂ injection
- **Type**
 - 1 Collaborative Project with a predominant research component



Topic 5&6.2.5: Extending the Value Chain for GHG Emissions

- **Aim**
 - ➔ Make policy makers and industries in emerging coal and oil producing countries familiar with European methane recovery and utilisation technologies
- **Approach**
 - ➔ Reinforce and complement EU initiatives with the Methane2Markets (M2M) partnership
 - ➔ Dissemination actions and pilot projects to advance transfer of European technologies on recovery and use of methane
- **Type**
 - ➔ Collaborative Project
 - ➔ Technology transfer to less developed M2M member countries

Topic 7.3.4: Analysis and scenarios of energy infrastructure evolution

Content/Scope:

- ➔ Analysis of the prospective energy technologies and their incorporation
- ➔ Roadmap for the coming 30-40 years
- ➔ - Technology driven changes for Europe wide electricity and gas networks based on different scenarios including storage options, new and refitted high-voltage transmission lines – prevention of black-outs and cascade effects.
- ➔ - Methodology for transmission investments on multi-national level

● **Funding scheme:** Collaborative project.

● **Expected impact:** The results should provide critical input, in terms of tools, criteria, benchmarks, for political, infrastructure and network decision makers, power distributors and should ease PAN-European approaches and harmonisation.

Topic 7.3.5: More efficient integration of renewables

Content/Scope:

Grid related scenarios of combined electricity/heat generation and electricity from renewable sources for 2030-2050.

Options for gas and other current and future energy carriers

Optimisation between centralised and distributed options for generation and distribution

Regarding electricity: medium, high and very high Voltage Transmission - including renewable energy feed-in and storage;

Regarding gas - regional, national and trans-national networks including off-shore pipelines, biogas feed-in and underground storage;

Regarding heating systems: different regional scenarios, including district and industrial networks and heat/cold storage options.

Funding scheme: Collaborative project.

Expected impact: Results should provide input, in terms of tools, criteria, benchmarks, for political, infrastructure and network decision makers, power distributors and should ease PAN-European approaches and harmonisation.



ACTIVITY ENERGY.8 (TREN): ENERGY EFFICIENCY AND SAVINGS

- **Areas open under TREN 2007 call**
 - ➔ **AREA ENERGY.8.1 : EFFICIENT ENERGY USE IN THE MANUFACTURING INDUSTRY**
 - ➔ **AREA ENERGY.8.2 : HIGH EFFICIENT POLYGENERATION**
 - ➔ **AREA ENERGY.8.5 : INNOVATIVE STRATEGIES FOR CLEAN URBAN TRANSPORT:CIVITAS-PLUS**
 - ➔ **AREA ENERGY.8.6 : SOCIO-ECONOMIC RESEARCH AND INNOVATION**
 - ➔ **AREA ENERGY.8.7 : THEMATIC PROMOTION AND DISSEMINATION**
- **Areas not open under TREN 2007 call**
 - ➔ **AREA ENERGY.8.3 : ECO-BUILDINGS**
 - ➔ **AREA ENERGY.8.4 : CONCERTO**

AREA ENERGY.8.1 (TREN): EFFICIENT ENERGY USE IN THE MANUFACTURING INDUSTRY

- **8.1.1 Manufacturing and process industry: wastes & waste heat recovery and transfer (CP- mainly DEMO)**
 - ➔ Objective is to develop & demonstrate industrial and community waste recovery technologies for energy use and innovative material and heat recovery/transfer technologies.
 - ➔ Projects should:
 - ◆ be in the medium to large scale.
 - ◆ be integrated in the manufacturing process.



AREA ENERGY.8.1 (TREN): EFFICIENT ENERGY USE IN THE MANUFACTURING INDUSTRY

8.1.2 Manufacturing and process industry: SME's energy innovation (CP- mainly DEMO)

- ➔ Objective is to develop & demonstrate innovative energy systems in SME manufacturing facilities for the reduction of cost and environmental impact.
- ➔ Projects should:
 - ◆ aim to maximise the overall energy efficiency.
 - ◆ aim to maximise the use of natural resources.

AREA ENERGY.8.1 (TREN): EFFICIENT ENERGY USE IN THE MANUFACTURING INDUSTRY

- **8.1.3 Manufacturing and process industry:
Innovative energy efficient manufacturing
processes (CP- mainly DEMO)**
 - ➔ Objective is to research, develop & demonstrate new or improved industrial processes with substantial energy savings in primary energy and increase in energy efficiency.
 - ➔ Projects should:
 - ◆ incorporate a systems approach in the energy and materials cycles
 - ◆ aim to maximise the overall energy efficiency
 - ◆ aim to maximise the use of natural resources and reduce use of fossil fuels.



AREA ENERGY.8.2 (TREN): HIGH EFFICIENT POLYGENERATION

● 8.2.1 High efficiency polygeneration applications with RES (CP- mainly DEMO)

- ➔ Objective is to demonstrate polygeneration applications based on RES. Attention will be given to sustainable solutions with emphasis on application driven projects.
- ➔ Projects should:
 - ◆ aim to maximise the overall energy efficiency
 - ◆ aim to maximise the use of natural resources



AREAS COVERED BY CIVITAS Plus

- AREA ENERGY.8.5 (TREN):
INNOVATIVE STRATEGIES FOR CLEAN URBAN TRANSPORT:CIVITAS-PLUS
→ 8.5.1: Testing innovative strategies for clean urban transport
- AREA ENERGY.8.6 (TREN):
SOCIO-ECONOMIC RESEARCH AND INNOVATION
→ 8.6.1: Support action for evaluation and monitoring CIVITAS-Plus
- AREA ENERGY.8.7 (TREN):
THEMATIC PROMOTION AND DISSEMINATION
→ 8.7.2: Support action for coordination and dissemination CIVITAS-Plus (CSA)



AREA ENERGY.8.7 (TREN): THEMATIC PROMOTION AND DISSEMINATION

● 8.7.1 Promotion & Dissemination (CSA)

- ➔ Objective is to facilitate the smooth penetration of energy saving technologies in the manufacturing industry and polygeneration sectors.
- ➔ Activities may address promotion campaigns, dissemination of experiences and results from successful projects as well as educational activities.
- ➔ Projects need to demonstrate a European approach and dimension.
- ➔ Projects should be in coherence with the Intelligent Energy Europe programme.