

TOWARDS A EUROPEAN GEOHERMAL ENERGY TECHNOLOGY PLATFORM

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OUTLINE

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- ◆ The European GE scene
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 - R&D background
 - Actors
- ◆ Priorities
 - Industry needs
 - R&D
 - Stakeholders
- ◆ Towards a GE ETP
 - Working document/ Strategic Plan
 - Schedule
 - Implementation
- ◆ Conclusions/Recommendations

EUROPEAN TECHNOLOGY PLATFORMS

WHAT ARE EPTs ALL ABOUT?

◆ Strategic Issues

- Address future growth, competitiveness and sustainability challenges via technologically relevant actions
- Better adjust R&D priorities to industry needs

◆ Impacts

- Shared vision of stakeholders
- Influence a wide range of policies
- Reduced fragmentation of R&D actions
- Mobilisation of (public and private) funding sources

MORE ABOUT ETPs

◆ OBJECTIVES/MILESTONES

- Long term (2020-2050) European Vision
- Strategic Research Agenda (SRA)

◆ ACTIONS

- Involve stakeholders for definition of RTD programmes
- Strengthen coordinated actions between Industry, Research and Market
- Implement a strategic plan

EPT PROCESS

Stakeholders, led by industry, come together to **agree a common vision** for the technology.

Stakeholders **define a Strategic Research Agenda** setting out the necessary medium- to long-term objectives for the technology.

Stakeholders **implement the Strategic Research Agenda** with the mobilisation of significant human and financial resources.

GE STATUS (2005)

| ITEM | INSTALLED CAPACITY | ANNUAL PRODUCTION |
|--------------------|--------------------|-------------------|
| POWER (*) | 820 MWe | 5.5 TWhe |
| HEAT AND COLD (**) | 8900 MWth | 21.5 TWth (***) |

(*) EU 15

(**) EU 25

(***) ca 50% supplied by heat pumps

GE DEVELOPMENT TRENDS (EU 25 @ 2020)

| ITEM | INSTALLED CAPACITY | ANNUAL PRODUCTION |
|---------------------|-----------------------|-------------------|
| POWER (*) | 2000-6000 MWe | 15.5-42 (*) TWhe |
| HEAT AND COLD (***) | 25000-39000 (**) MWth | 58-91 (**) TWth |

(*) achievable via EU support mechanisms

(**) after EGEN projection

(***) 75% estimated from heat pump input

EUROPEAN GEOTHERMAL RESEARCH STATUS

| PROJECT ACRONYM | ACTION TYPE | COORDINATOR | DESCRIPTION |
|-----------------|-------------|-------------|--|
| EGS Soultz(*) | STREP | EEIG | Enhanced Geothermal System |
| ENGINE (*) | CA | BRGM | Enhanced Innovative Network |
| GROUNDHIT (*) | STREP | CRES | GHSP – high tech |
| LOW-BIN (*) | STREP | CRES | Efficient low temperature binary power |
| I-GET (*) | STREP | GFZ | Exploration |
| K4RES | | IEEA | Renewable heat in Europe |

(*) 6th RTD FP

INDUSTRY PRIORITIES

◆ AMONG OTHERS

- secure first a reliable GE development market via adequate, EU WIDE, incentives and stimuli
- build-up a European expertise via an effective network of SMEs competent in design/ engineering/ implementation/ maintenance of GE undertakings
- remove the legal/institutional barriers constraining GE development (consistent Mining Law)

◆ PUBLIC SUPPORTED ACTIONS REQUIRED IN THE LAUNCHING PHASE

RESEARCH PRIORITIES (1)

◆ POWER AND CHP

- EGS technology transfer
- High temperature/hard rock drilling technology
- Long lasting well completions
- Injection technology
- Induced seismicity
- Well stimulation
- Thermochemistry (scaling)
- Single/multiphase high temperature pump technology
- Conversion technology (ORC, total flow)
- Sustainability issues

RESEARCH PRIORITIES (2)

◆ HEAT AND COLD

- Adapted drilling technologies (deep/petroleum; shallow/groundwater, geotechnical) well completions (fibreglass, patching) and workover state of the art
- Injection technology (fine grained clastics)
- Thermochemistry (corrosion/scaling)
- Sustainability issues
- Absorption cooling

RESEARCH PRIORITIES (3)

◆ MISCELLANEOUS

- Reservoir assessment/simulation
- Aquifer storage
- Plant automatisation
- Desalination
- Regional impact issues (Mediterranean islands)
- Last not least education and training

IDENTIFICATION OF ELIGIBLE STAKE HOLDERS (Industry, Science, Policy)

- ◆ **INDUSTRY**
 - contractors (drilling,...)
 - manufacturers
 - builders
 - energy producers (utilities)
- ◆ **RESEARCH**
 - academic/non academic, public/private institutions
- ◆ **POLICY MAKERS**
- ◆ **SERVICES, CIVIL SOCIETY, INDIVIDUALS**
 - installers
 - consulting/ engineers, designers, architects, developers
 - service companies (heating, well services, trouble-shooters...)
 - NGOs (EGEC, IGA-EB...)
 - physical planners
 - professional associations

TOWARDS A GE ETP WORKING DOCUMENT

- ◆ Elaboration of a far sighted perspective document (the so-called vision report)
 - i. identifying the resource base, its present and future reclamation potentials and related technological status
 - ii. formulating a strategic development outline
 - iii. advocating the need for a European Geothermal Technology Platform as a means to implement the strategy

TOWARDS A GE ETP

◆ TENTATIVE SCHEDULE

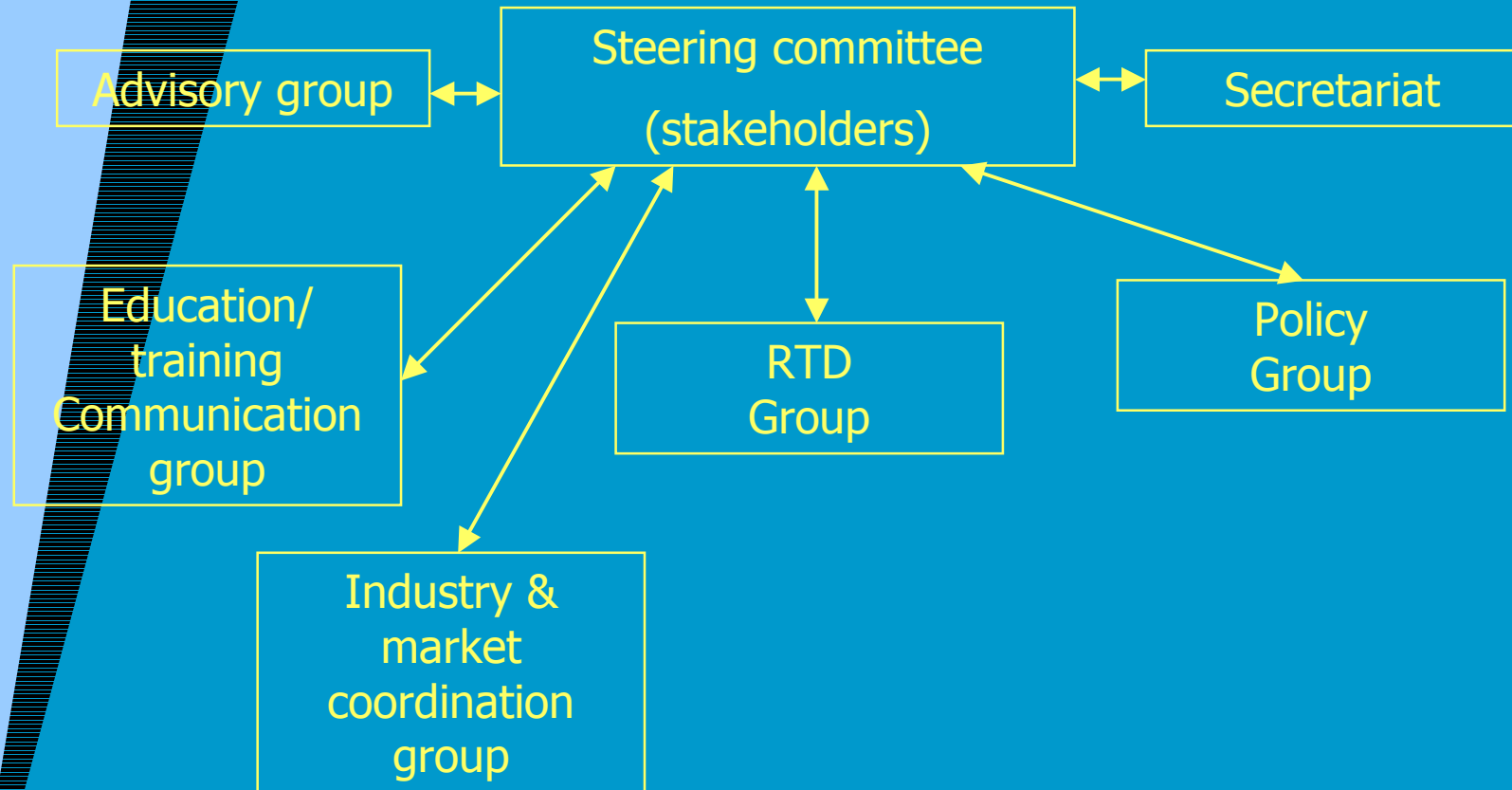
- set up an ad-hoc working group under the auspices of IGA-EB/EGEC a future stakeholder steering committee – January 2007
- circulation of a draft working document (the future vision report) – March 2007
- amendment/approval of the final GE EPT proposal and of tentative Strategic Research Agenda – May-June 2007

TOWARDS A GE ETP IMPLEMENTATION

◆ STRATEGIC PLAN

- Strategic Research Agenda
- Coordination of RTD actions
- Implementation of policies, market consolidation and support/incentive actions

TOWARDS A GE ETP STRUCTURE. ORGANISATION



CONCLUSIONS. RECOMMENDATION

- ◆ ACT FAST AND EFFECTIVE IN DRAFTING A RELEVANT PROJECT.

DEADLINE EGC MAY 30 2007