



Demonstration of a **S**mall scale **M**obile **A**gricultural **R**esidue decentralized **C**ombined **H**eat and **P**ower unit



<http://smartchp.eng.auth.gr>

Project overview



- ✓ Duration: 1/1/2010 – 31/12/2012
- ✓ Budget: 947,287 € (EC co-funding: 47.52%)
- ✓ Location: Thessaloniki & W. Macedonia



Project's Aims

- Technology application in real conditions
- Promotion to local actors & entrepreneurs
- Biomass energy potential evaluation

Project Actions



- ✓ **Regional biomass availability profile**
 - *Detailed survey of generated agricultural residue streams in the region of Western Macedonia & estimation of selected species' suitability for gasification*
- ✓ **SMART – CHP unit development**
 - *Design and manufacture of a 5kWel/12kWth mobile unit which consists of a gasifier combined with a power generator set*
- ✓ **Demonstrative operation**
 - *Demonstrative operation at 4 locations for 2 weeks each & preparation of a report concerning technical and administrative aspects*
- ✓ **Demonstration results & sustainability analysis**
 - *Evaluation of system performance and highlight of technical and administrative obstacles*
- ✓ **Dissemination of project issues and results**
 - *Create awareness about the project results through high publicity events and documentation*

Expected results



- ✓ Technical & management issues unravelling
- ✓ Residual utilisation potential promotion to stakeholders and target groups
- ✓ Knowledge transfer between beneficiaries, target groups & key players
- ✓ SMART-CHP debate initiation
- ✓ Increase general public awareness
- ✓ Promotion & development of SMART-CHP units



Action 1 results

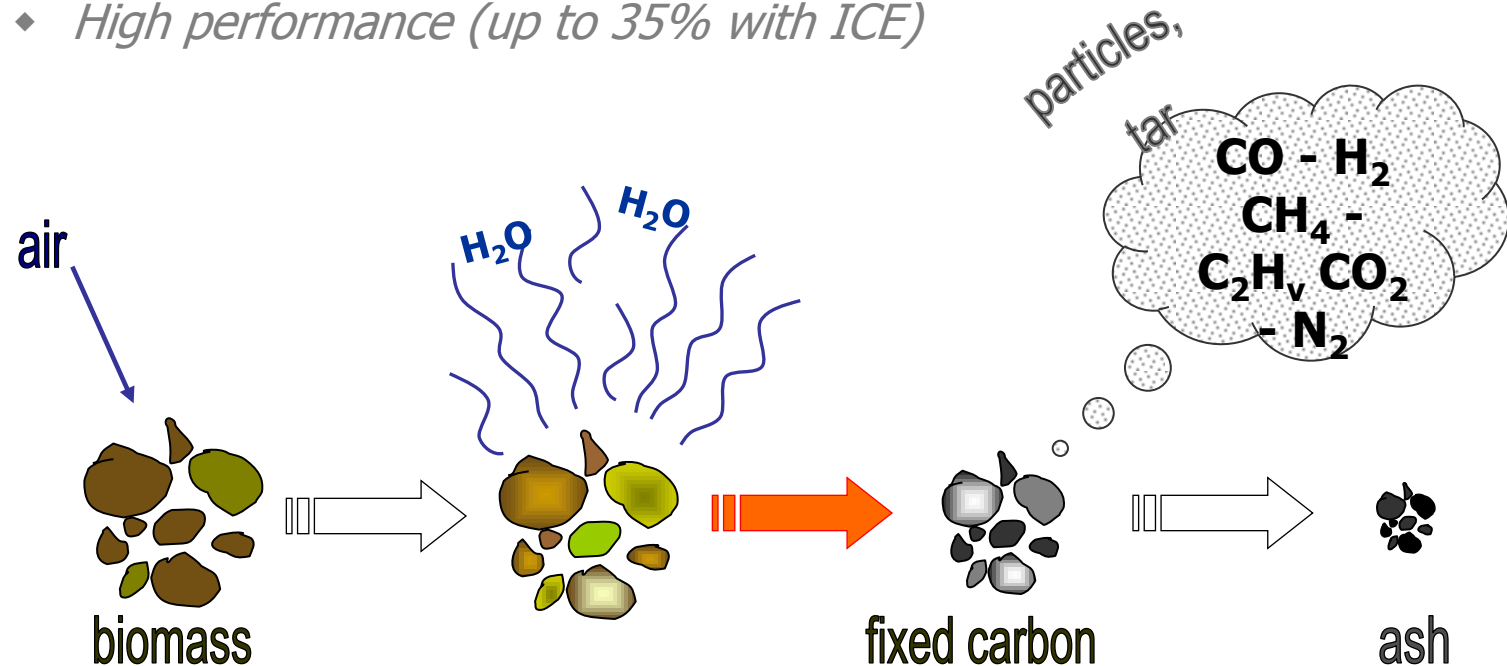


Gasification



✓ Gasification advantages

- ◆ *High efficiency for electricity production at small scale*
- ◆ *Good prospects for use in CHP*
- ◆ *High performance (up to 35% with ICE)*



Gasifier – ICE coupling

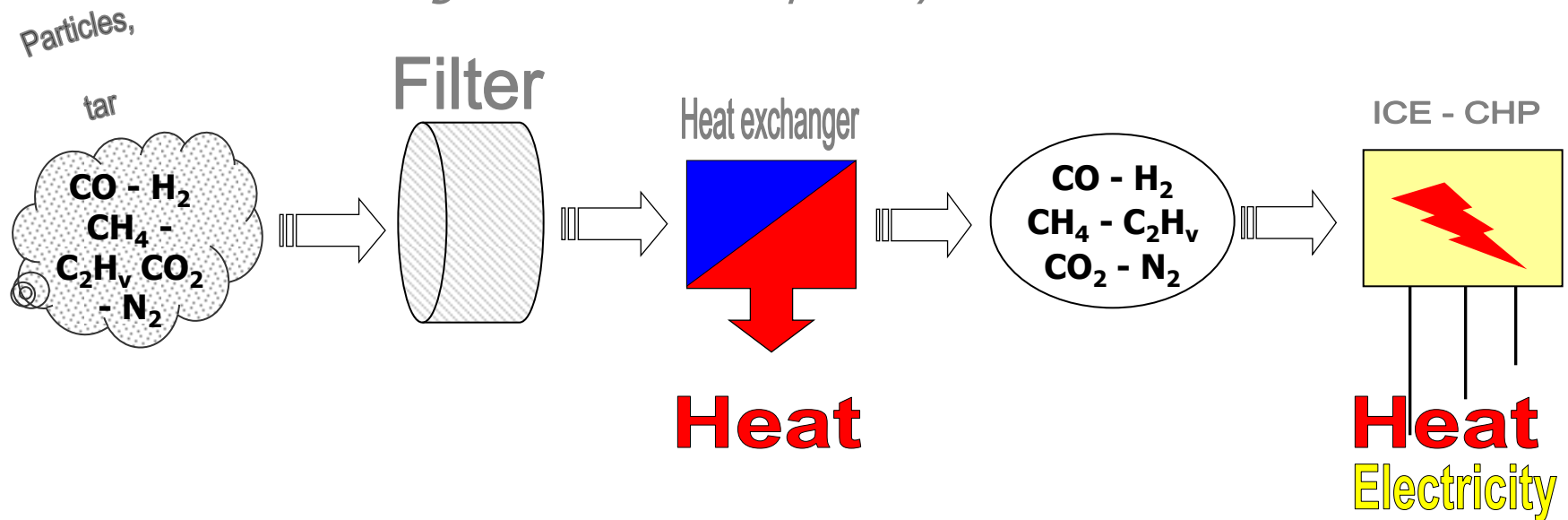


✓ SMART-CHP gasifier

- ◆ *Bubbling fluidized bed technology*
- ◆ *Thermal efficiency → 85%*

✓ ICE

- ◆ *Otto LPG engine with CHP capability*



SMART – CHP unit



Gasifier



ICE



Container

 **SMART CHP**
Biomass energy

Preliminary economic analysis





Thank you!

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Project SMART-CHP



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