

Increased use of biomass in renewable heating and cooling: R&D and industry needs

Cylergie, COFELY Research center

COFELY: A GDF SUEZ GROUP COMPANY

- **Cofely is the dedicated brand for B to B energy services.**
- **Staff: 77000**
- **Present in more than 30 countries**
- **N°1 in Europe for energy efficiency services**
- **1500 sites in the world**
- **180 heating & cooling networks operated worldwide**

Energy audits



Energy Performance Contracts



Energy use management



Renewable energies

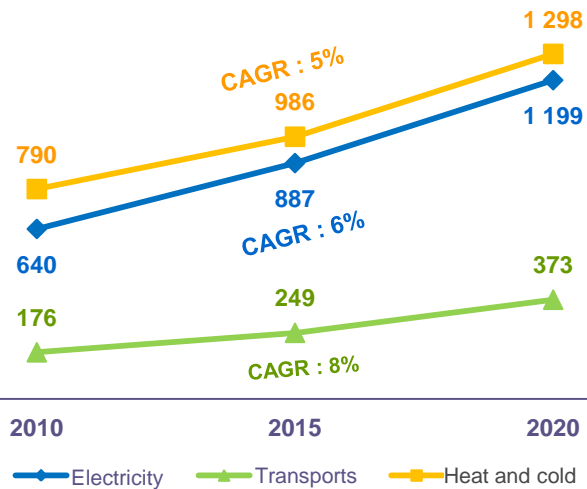


Urban networks and local production



THERMAL BIOMASS: A DRIVER FOR REN EU AMBITIONS

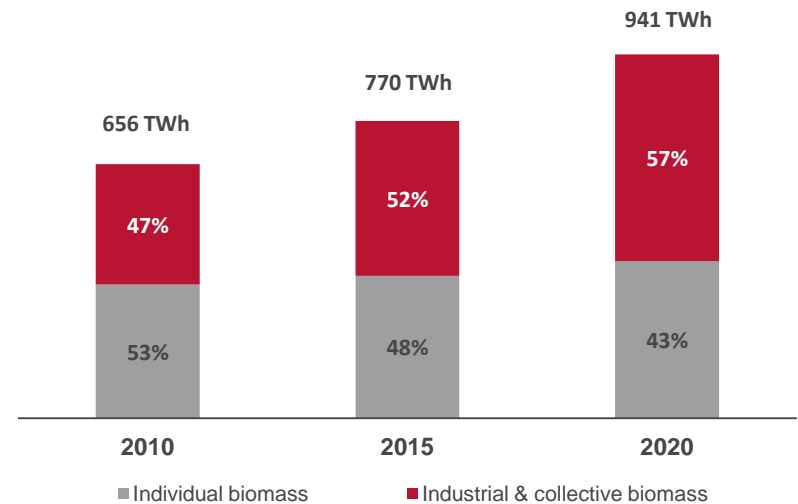
Contribution of REN
EU27 – TWh – Final energy



Source : NREAPs 2011, Additional Energy Efficiency Scenario

- **Heating and cooling: first contributors of the EU REN objectives**
- **Thermal REN sources**
 - **Solid biomass: 72%**
 - **Other: 28%** (Heat Pumps, biogas, biofuels, thermal solar, ...)

Use of solid biomass
EU27 – TWh – Final energy



Source : NREAPs 2011, Additional Energy Efficiency Scenario – *Hors Pologne, Malte, Estonie

- **Collective biomass: 57% of energy uses**
 - **Buildings**
 - **Heating networks**
 - **Industry / process**

➔ **Core business for Cofely**

BIOMASS IN DISTRICT HEATING NETWORKS

Key issues

- **Strong demand for biomass in district heating networks**
 - Target: 50 to 80% REn
 - Most call for tenders ask for biomass capacities
 - Both existing and new networks involved in biomass
- **In France, this demand meets with the renewal of district heating concessions**
- **75% of district heating projects include the development of biomass capacities**



BIOMASS

Thermal biomass
+ 200 installations



Picture : Eurenco (12 T/h)

CHP

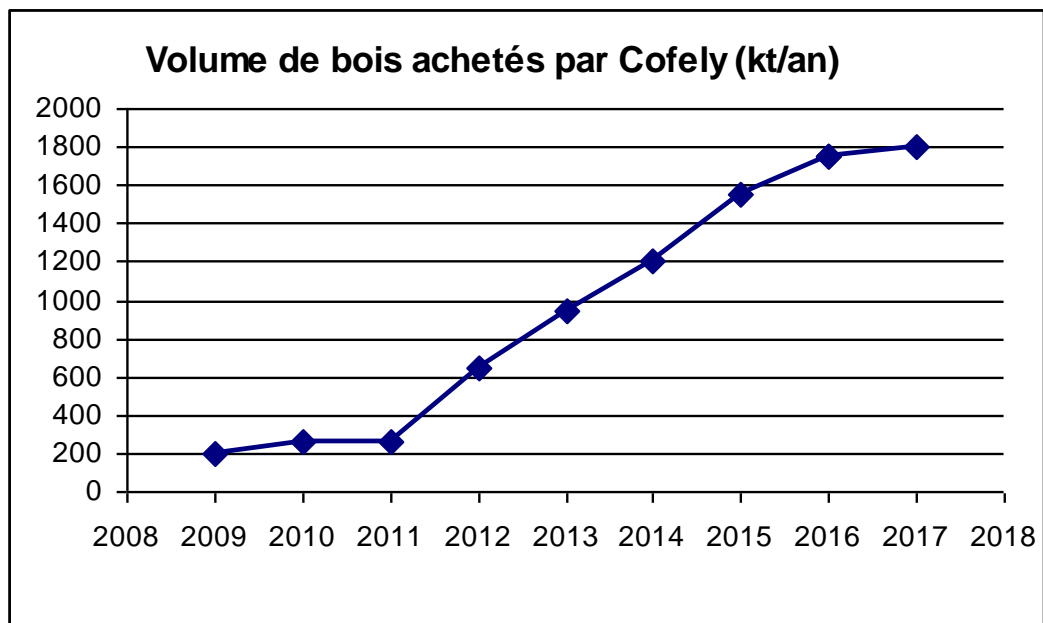
7 in operation (+ 5 under construction)



Picture : Forbach (6.4MWe ; 24 MWth)

SUSTAINED GROWTH OF BIOMASS CONSUMPTION: X 10 BETWEEN 2011 AND 2015

- **A rapid change of scale for COFELY**
 - 1 500 kt expected in 2015
 - A small part for electricity production



- **A change of the context for the wood sector**
 - The market share of wood fuel in France will be equivalent to that of the wood industry in 2015, about 10 Mt / year
 - Cofely will represent 15-20% of the energy use of biomass (log including)

- **Fuel supply**
 - **There is no good or bad fuel, but adapted or not to the boiler (unlike domestic boilers)**
 - **Security of supply**
 - **Fuel preparation (to give added value to the product: the preparation cost has to be lower than the energy gain)**
 - **New fuels**
 - **Better appreciation of the fuel quality for :**
 - **A better management of commercial transaction**
 - **A better utilization of boilers**
 - **Dust of wood risk (ATEX) (especially if the wood is dry)**
 - **Safety of persons management**
 - **Safety of facilities management**

KEY ISSUES: FUEL QUALITY MEASUREMENT

- **The LHV (Lower Heating Value), depends on :**
 - **Moisture**
 - **Ashes**
- **Biomass fuel specificities**
 - **Very large number of products**
 - **Mixtures of several elementary fractions**
 - **On the same site, variability deliveries**
 - **Samples complicated / dangerous**
- **In most of cases, it's very difficult to find a valid solution**



- **Smart facilities operation, why ?**
 - **To improve the energy efficiency of our boilers**
 - **Condensation : work on demand management**
 - **Storage**



- **To evaluate as good as possible the quality of the fuel to :**
 - **go back to the energy performances and their degradations**
 - **act by correcting automatically the settings**
- **To minimize the impact of biomass boilers on air quality to ensure the development**

- **Smart facilities operation and environmental performances**
 - Concerning the particulate pollution : 99% of the pollution can be trapped with filters
 - Less than regulations, the problem reminds economical
 - Concerning other pollutants
 - NOx: ok for new boilers (properly sized), sometimes more difficult for existing boilers (fire volume too small)
 - Unburned (organic) controlled by the quality of combustion and fuel



- **Ashes**

- **An indicator of the quality of the fuel and combustion**
 - **Management of their handling / packaging**
 - **The output growth :**
 - **A potential problem**
 - **But also an opportunity for treatment companies (cement...)**
- The elimination and valorization sectors are important issues**

Thanks for your attention
