Heat & Power

GENERAZIONE CONTINUA DI ENERGIA ELETTRICA E CALORE

An ESCo experience on Small Scale CHP

CESI Ricerca, Milano

22th October 2008

Who is Heat & Power

Heat & Power is an ESCo specialising on Small Scale Cogeneration

- → Installs and runs its own plants
- → Supplies cogenerated energy (Heat, Power, Cool) to the clients at lower tariffs
- → Brings, where requested,
  - → Emergency power in case of black-out
  - → Environmental image

Heat & Power uses natural gas, biogas, biomasses

Heat & Power presently runs the **widest Small Scale CHP network** in Italy, with more than 35 cogenerators and important Italian and Multinational clients

Mainly Small Scale CHP…

130 kW mGT trigeneration Plant

…with good experience on Medium Scale

Efficiency Index (IRE)

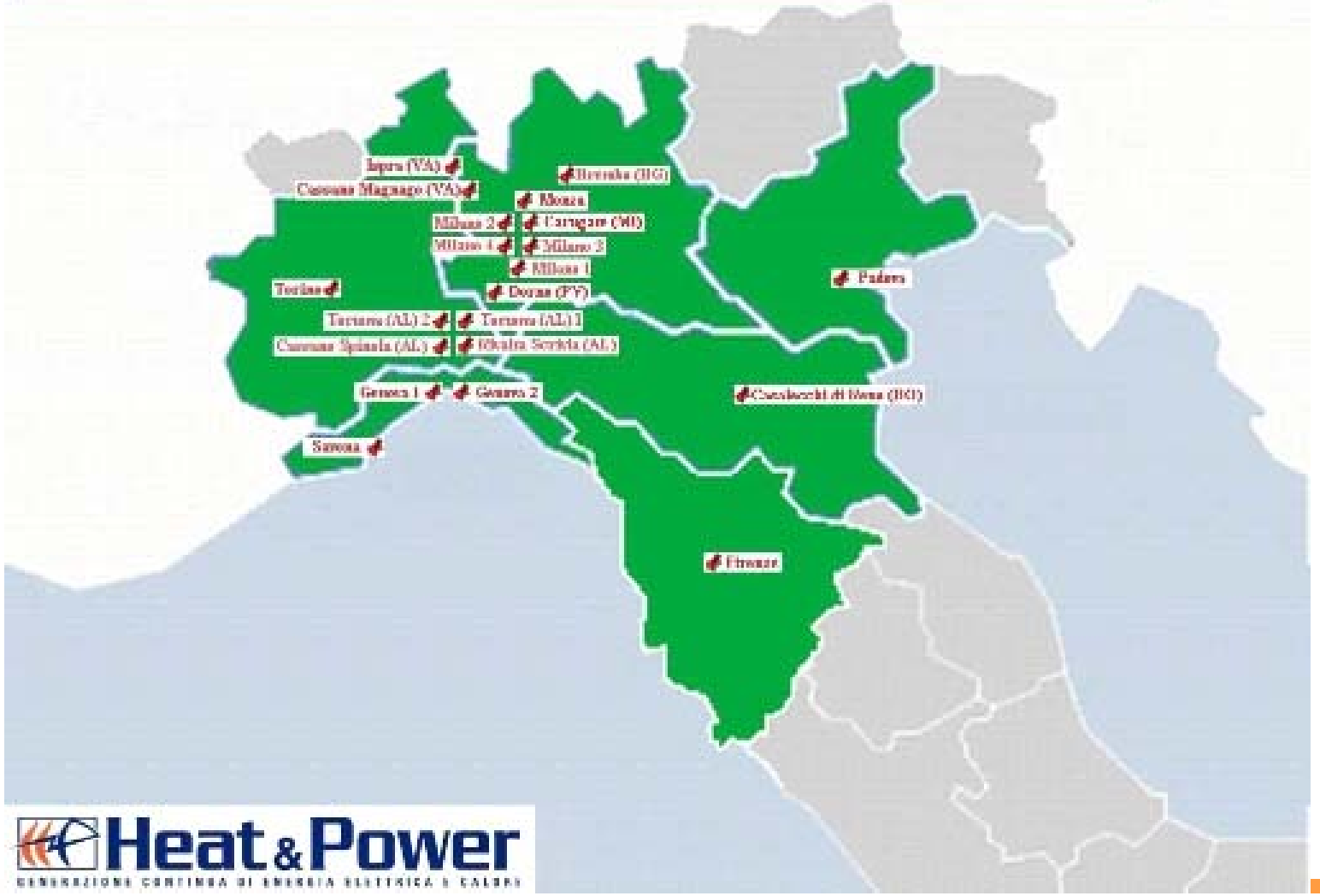
goes from 10 to 30%

4.800 kW GT Cogeneration Plant

Remoting

- Heat & Power's plants are run locally by a dedicated PLC (SOEC®) and managed by the Tortona Remote Control Room

Italia : le decentrali HEAT and POWER



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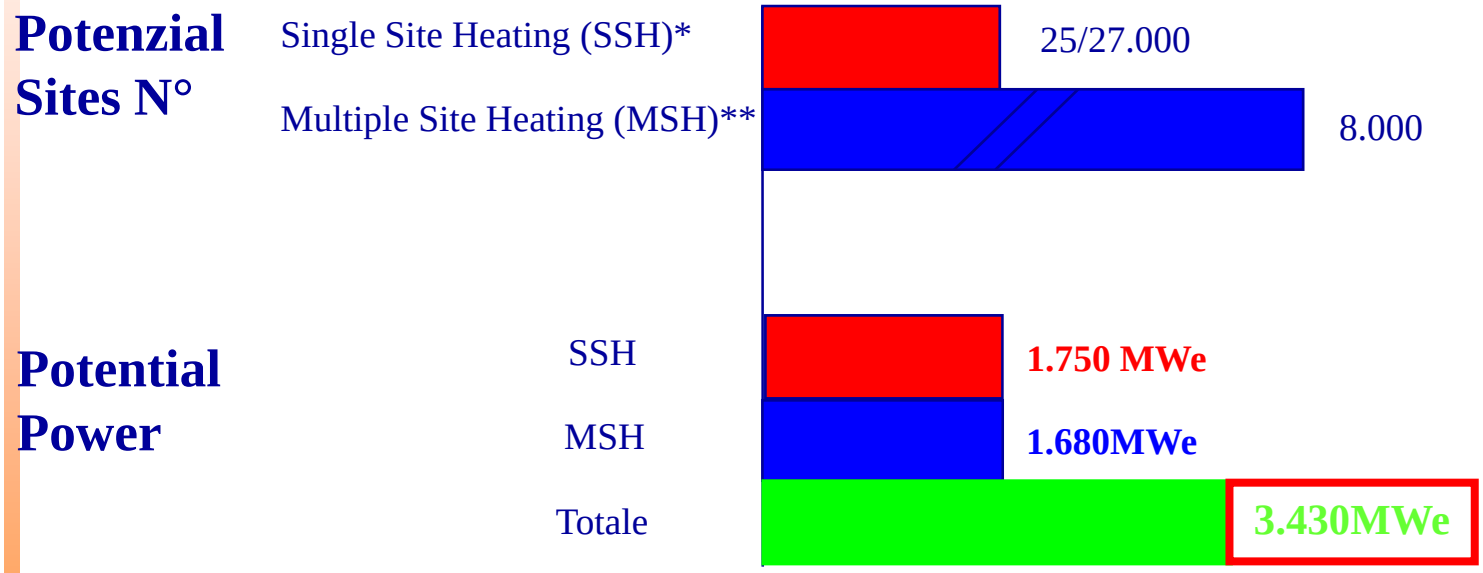
The potential of Small Scale CHP in Italy is huge



2006 ASSOESCO Research

* Includes 15.000 office buildings, 1.500 commercial centers, 5.000 sport facilities, 1.000 hotels, 2.000 hospitals and e 2.500 communities (religious, civil, army). The research reckons 70% of the sites technically fit the project.

** Blocks of around 500 apartments, connected by a Proximity District Heating (PDH) with 300 kW CHP

But economics don’t agree yet….

SMALL COGENERATION PLANT				
100 kWe; only heat; microturbine				
Sport Center with pool (industrial tax on N-gas)				
Power kWe	*100*			
Saturation	*72%*			
h/year	*6.307*			
Average electric efficiency	*27,3%*	*240.910*	*(mc)*	

Small Scale CHP Economics

SMALL COGENERATION PLANT

	Power	Heat		
Gross production kWh	630.720			
Auxiliary kWh	9.460			
Net production kWh	621.260	973.249		
Tariff €/kWh	0,11299	0,04721	**10% rebate on Power. Around 7k€**	
White Certificates	0	(Today no White Certif.TEE)		
ESCo Turnover €	**70.196**	**45.947**	**116.143**	
Natural Gas €			**82.261**	
O & M €			**11.200**	*0,018*
Gross Operational Margin			**22.682**	

Actual Data 2007

Financial profitability evaluation

Investment €: 160.000

Cash Flow

0	-160.000	
1	22.682	-137.318
2	22.682	-114.635
3	22.682	-91.953
4	22.682	-69.270
5	22.682	-46.588
6	22.682	-23.906
7	22.682	-1.223
8	22.682	21.459
9	22.682	
10	22.682	

Simple Return time: 7,5 years

→Result: last year less than 100 units installed in Italy

Small Scale CHP Economics

SMALL COGENERATION PLANT

	Power	Heat	
Gross production kWh	630.720		
Auxiliary kWh	9.460		
Net production kWh	621.260	973.249	
Tariff €/kWh	0,11299	0,04721	
White Certificates	3.154 (ex Scheda 21 AEEG)		
ESCo Turnover €	**73.350**	**45.947**	**119.297**
Natural Gas €			**82.261**
O & M €			**11.200** *0,018*
Gross Operational Margin			**25.836**

Actual Data 2007

Fimancial profitability evaluation

Investment €: 160.000

Cash Flow

0	-160.000
1	25.836
2	25.836
3	25.836
4	25.836
5	25.836
6	25.836
7	25.836
8	25.836
9	25.836
10	25.836

-134.164	
-108.328	
-82.492	
-56.656	
-30.820	
-4.984	
20.852	
46.688	

Simple Return time: 6,2 years

Small Scale CHP Economics

SMALL COGENERATION PLANT

	Power	Heat	
Gross production kWh	630.720		
Auxiliary kWh	9.460		
Net production kWh	621.260	973.249	
Tariff €/kWh	0,11299	0,04721	
White Certificates	18.922	(necessary 3c€/kWh)	
ESCo Turnover €	**89.118**	**45.947**	**135.065**
Natural Gas €			**82.261**
O & M €			**11.200** *0,018*
Gross Operational Margin			**41.604**

Actual Data 2007

Fimancial profitability evaluation

Investment €:	160.000	
Cash Flow		
0	-160.000	
1	41.604	-118.396
2	41.604	-76.792
3	41.604	-35.188
4	41.604	6.416
5	41.604	48.020
6	41.604	89.624
7	41.604	131.228
8	41.604	172.832
9	41.604	
10	41.604	

Simple Return time: 4 years

Incentives summary

Absolute lack of incentives (White Certificates from AEEG Scheda 21 are blocked)

If present, they would not be sufficient (around 0,5 c€/kWh)

Necessary at least 3 c€/kWh to exploit the huge potential of the Small Scale CHP market

The market has been waiting years for the 2004/8/CE Cogeneration Directive to be accepted in Italy.

Law came in Jan 07.

Now application Decrees still missing

About White Certificate in the ESCo experience

- Uncertainty in the certification times (*emission comes months later the request*) → difficult use for cash-flow and financing
- Low frequency White Certificates emissions: selling waves
- Asimmetric market: few “obliged” giants vs many small ESCos
- No real time information system about W.Cert requested quantities → difficult estimate future value
- ESCo cannot afford to keep the Certificates for better times → a new organization among ESCos –perhaps with the support of a financial subject- could get more stable and higher prices

So what: today

- Huge market potential for Small Scale CHP
- Interesting for business, environment and politics as well
- Presently no incentives and strong red tape for permitting process

→ No market

So what: tomorrow

- We understand a mechanism aimed to put on the same level (*CO2 avoided*) different technologies, but
- **In this way, some technologies don't manage to start**
- In our case: no installed volumes, no standardization, no investments reductions

- A solution could be to **temporary boost White Certificates for potential technologies like Small Scale CHP**
- A higher White Cert value for some years would bring important installed volumes and consequent cost reductions, letting the market to start.

Today it may seem an opinion in the dark…..
….but we believe we'll do it!

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