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Preliminary remarks on the implementation of a market for white certificates: the experience of Fondazione per l'Ambiente in Piedmont region

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Our work

- Research
- Documentation
- Dissemination

...for better environmental policies at local level





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Our Founders

- Local authorities
- Utilities
- Bank Foundations
- Chamber of Commerce
- Universities and Polytechnic





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Main streams

- Energy policies and environment
- Forestry and kyoto targets
- Local Public Services
- Instruments for decision making : cba, environmental accounting





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The TEE project

- Piedmont Region (one of our founders) asks Foundation to help the implementation of WhCert through the assessment of:
- the EE ES potential at regional level (supply potential)...
- the distributors availability to meet part of this potential (demand obligations)
- the role of ESCo



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Outline of the presentation

- Some spots of theory (irony dressed)
- Some data on Italian policy, utilities engaged, targets, and regional dimension
- Critical issues emerging from the first phase of our project
- Non conclusions and open questions



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Efficiency (EE) & saving (ES): synonymous?



$$Q_e = \beta Q_s + v$$

Where

Q_e = energy vector consumption

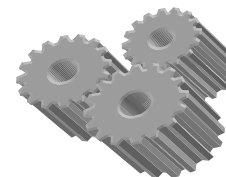
Q_s = service consumption

β = technical parameter

v = deviation due to human factors

Saving: just eliminate
unuseful energy
consumptions

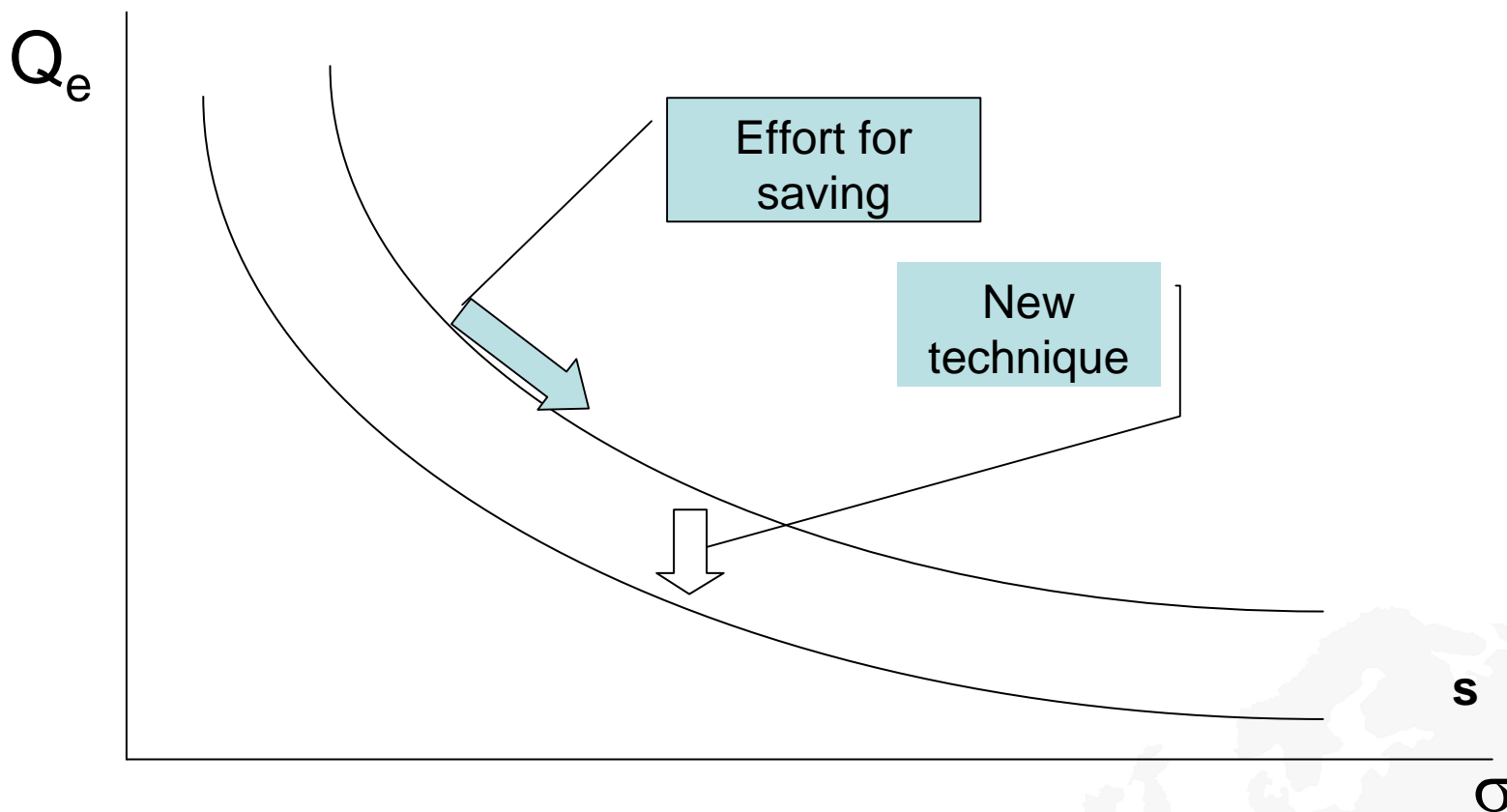
Efficiency: new
ways to do things





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Savings & efficiency





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EE & ES can be seen as resource pools

$$UC_{EE} = S (K_i + g_i)(1+r)^{-t} < p_e$$

traditional cb analysis of investments

$$TC_{ES} = \theta(\sigma) < -(p_e Q_{ES} - p_e Q_{bau})$$

Elusive costs(σ)of changing behaviour vs bill saving

According to literature the potential stays in the range of 15-20%
of total energy final consumption

(EU COM 2000, green paper COM 2000 769 final; Krause 1999; Frankl et al 1996)



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Harvesting EE & ES pools

Spotting the differences between

EnergyProviderCo (traditional energy services)

EnergyServicesCo (energy efficiency hunters, repaid by savings, financiers)

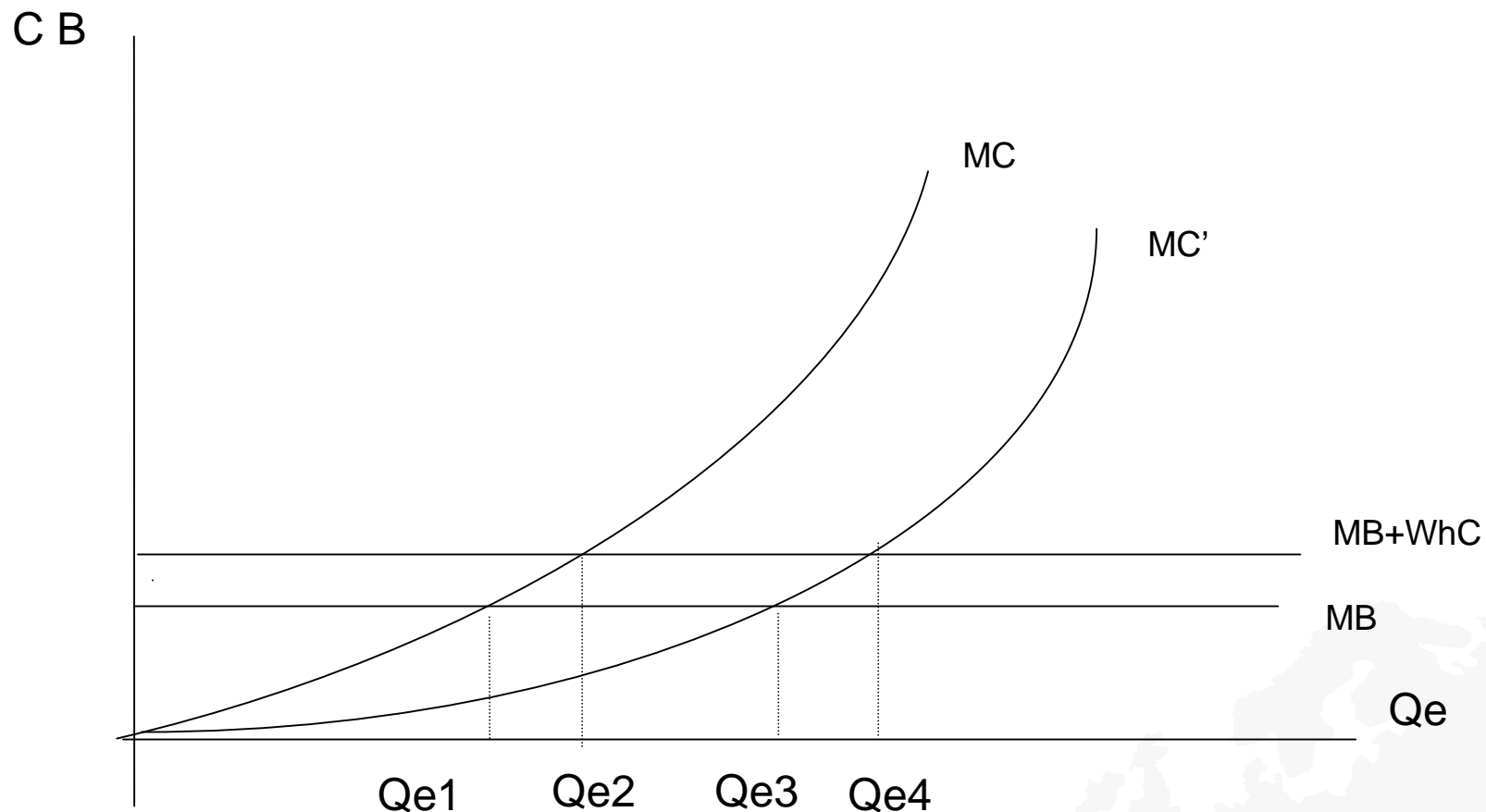
Financial systems at local level: not particularly sensitive to finance EE projects

Dedicated funds for EE projects



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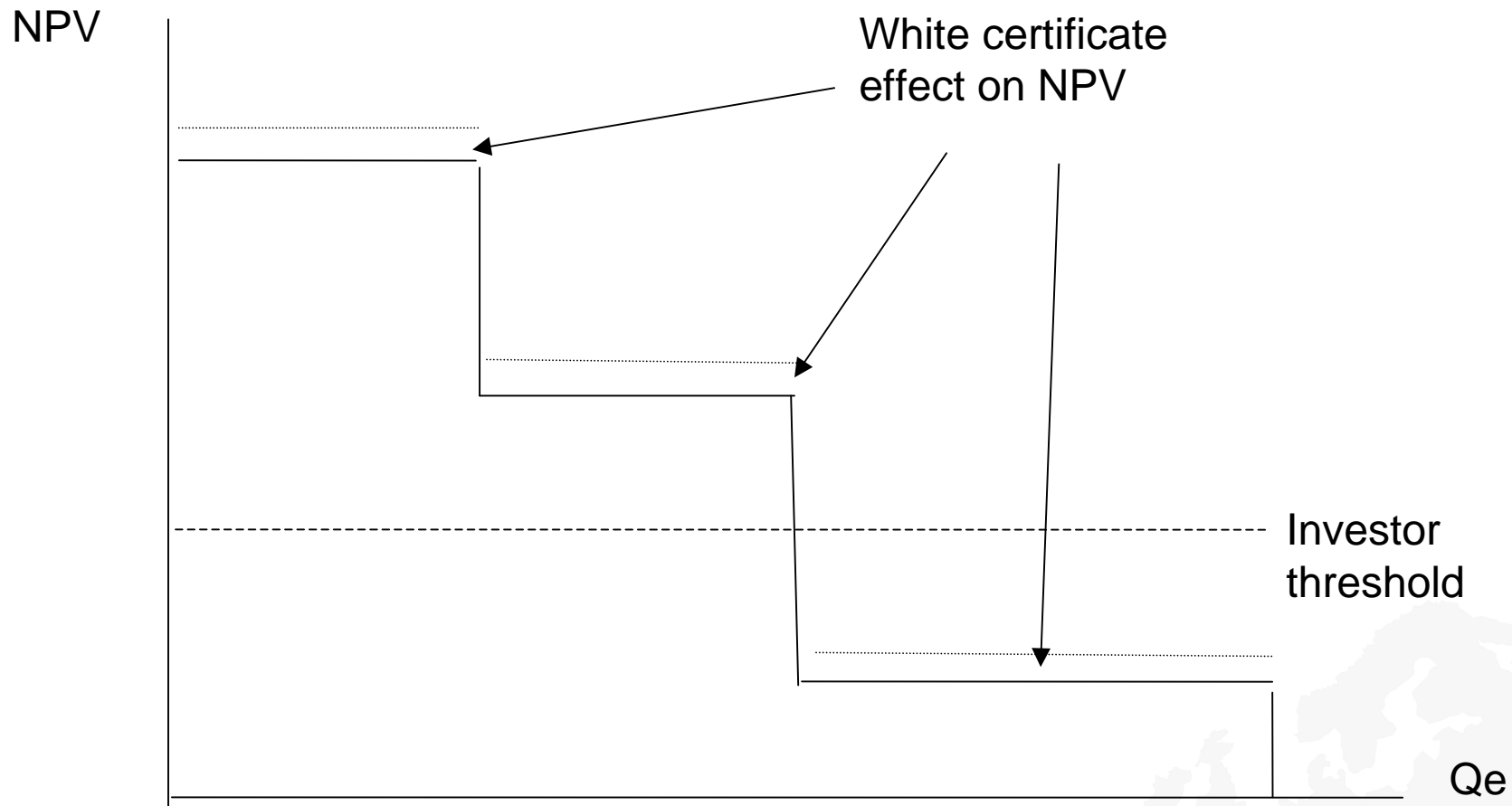
Marginal C&B, white cert





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The case for influential WhCert





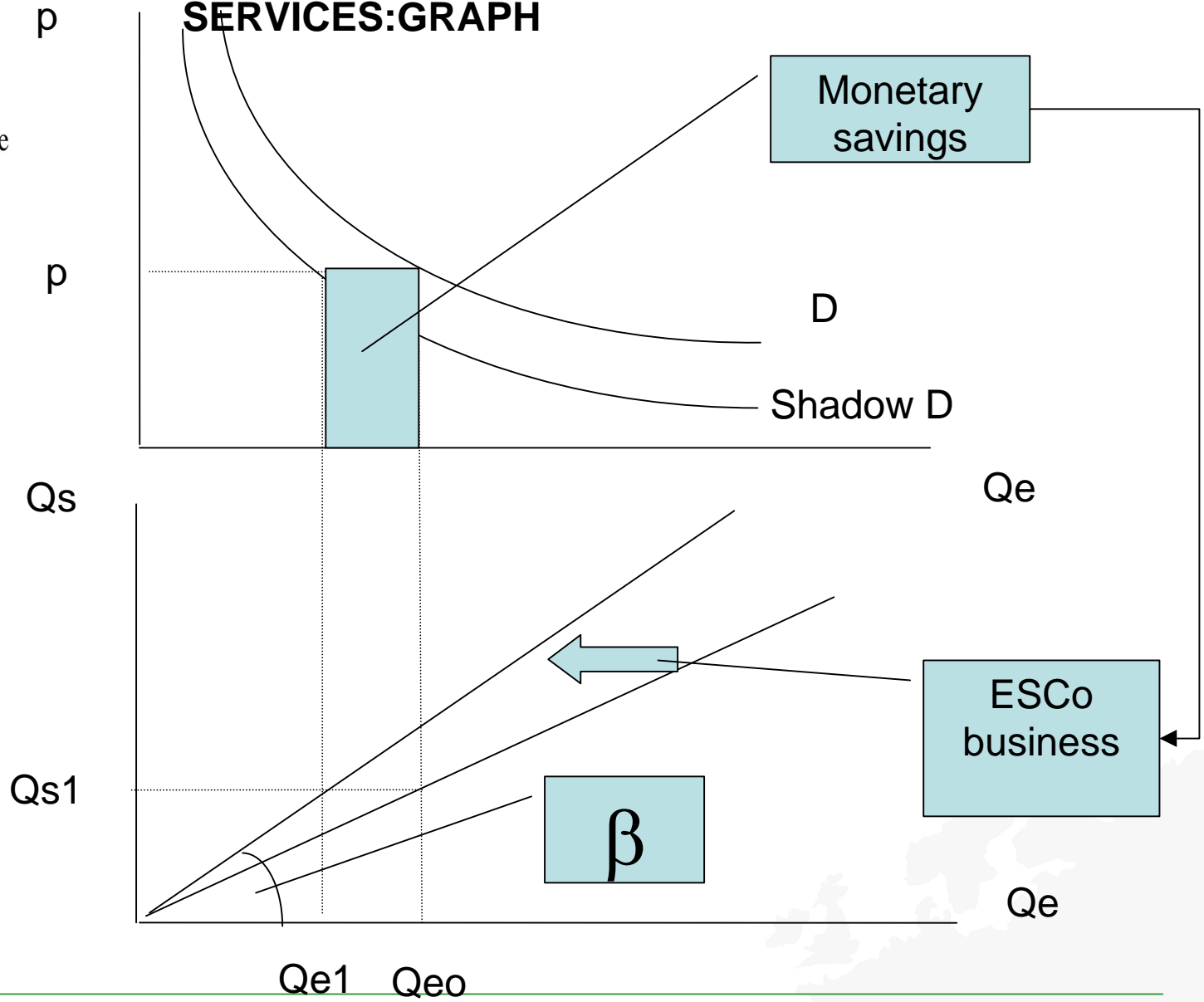
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ENERGY VECTORS AND ENERGY SERVICES:FUNCTIONS

- $D_e = f(p_e)$
- $Q_s = \beta Q_e$

Technical parameter

ENERGY VECTORS AND ENERGY SERVICES: GRAPH





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The theory of Efficient Tradable Rights and some numbers to represent it : A,B: two final energy users with different marginal cost of consumption abatement

1

x_a	x_b	TOTAL COST FOR A	MARGINAL COST FOR A	TOTAL COST FOR B	MARGINAL COST FOR B	TOTAL COST FOR A+B
x	50-x	CTA_a	cm_a	CTA_b	cm_b	CTA_a+CTA_b
0	50	1000,00		100,00		1100,00
1	49	966,94	33,06	104,04	4,04	1070,98
2	48	934,44	32,50	108,16	4,12	1042,60
3	47	902,50	31,94	112,36	4,20	1014,86
4	46	871,11	31,39	116,64	4,28	987,75
5	45	840,28	30,83	121,00	4,36	961,28
6	44	810,00	30,28	125,44	4,44	935,44
7	43	780,28	29,72	129,96	4,52	910,24
8	42	751,11	29,17	134,56	4,60	885,67
9	41	722,50	28,61	139,24	4,68	861,74
10	40	694,44	28,06	144,00	4,76	838,44
11	39	666,94	27,50	148,84	4,84	815,78
12	38	640,00	26,94	153,76	4,92	793,76



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2

The theory of Efficient Tradables and some numbers to represent it : **A,B: two final energy users with different marginal cost of consumption abatement**

x_a	x_b	TOTAL COST FOR A	MARGIN AL COST FOR A	TOTAL COST FOR B	MARGIN AL COST FOR B	TOTAL COST FOR A+B
13,00	37,00	613,61	26,39	158,76	5,00	772,37
14,00	36,00	587,78	25,83	163,84	5,08	751,62
15,00	35,00	562,50	25,28	169,00	5,16	731,50
16,00	34,00	537,78	24,72	174,24	5,24	712,02
17,00	33,00	513,61	24,17	179,56	5,32	693,17
18,00	32,00	490,00	23,61	184,96	5,40	674,96
19,00	31,00	466,94	23,06	190,44	5,48	657,38
20,00	30,00	444,44	22,50	196,00	5,56	640,44
21,00	29,00	422,50	21,94	201,64	5,64	624,14
22,00	28,00	401,11	21,39	207,36	5,72	608,47
23,00	27,00	380,28	20,83	213,16	5,80	593,44
24,00	26,00	360,00	20,28	219,04	5,88	579,04
25,00	25,00	340,28	19,72	225,00	5,96	565,28
26,00	24,00	321,11	19,17	231,04	6,04	552,15
27,00	23,00	302,50	18,61	237,16	6,12	539,66
28,00	22,00	284,44	18,06	243,36	6,20	527,80
29,00	21,00	266,94	17,50	249,64	6,28	516,58



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3



x_a	x_b	TOTAL COST FOR A	MARGIN AL COST FOR A	TOTAL COST FOR B	MARGIN AL COST FOR B	TOTAL COST FOR A+B
30,00	20,00	250,00	16,94	256,00	6,36	506,00
31,00	19,00	233,61	16,39	262,44	6,44	496,05
32,00	18,00	217,78	15,83	268,96	6,52	486,74
33,00	17,00	202,50	15,28	275,56	6,60	478,06
34,00	16,00	187,78	14,72	282,24	6,68	470,02
35,00	15,00	173,61	14,17	289,00	6,76	462,61
36,00	14,00	160,00	13,61	295,84	6,84	455,84
37,00	13,00	146,94	13,06	302,76	6,92	449,70
38,00	12,00	134,44	12,50	309,76	7,00	444,20
39,00	11,00	122,50	11,94	316,84	7,08	439,34
40,00	10,00	111,11	11,39	324,00	7,16	435,11
41,00	9,00	100,28	10,83	331,24	7,24	431,52
42,00	8,00	90,00	10,28	338,56	7,32	428,56
43,00	7,00	80,28	9,72	345,96	7,40	426,24
44,00	6,00	71,11	9,17	353,44	7,48	424,55
45,00	5,00	62,50	8,61	361,00	7,56	423,50
46,00	4,00	54,44	8,06	368,64	7,64	423,08
47,00	3,00	46,94	7,50	376,36	7,72	423,30
48,00	2,00	40,00	6,94	384,16	7,80	424,16
49,00	1,00	33,61	6,39	392,04	7,88	425,65
50,00	0,00	27,78	5,83	400,00	7,96	427,78



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EE/ES targets (decrees july 2004) Mtep/y

Electricity

year	Cumulated goal (Mtep)	Yearly goal (Mtep)
2005	0,1	0,1
2006	0,2	0,1
2007	0,4	0,2
2008	0,8	0,4
2009	1,6	0,8

Natural gas

year	Cumulated goal (Mtep)	Yearly goal (Mtep)
2005	0,1	0,1
2006	0,2	0,1
2007	0,4	0,2
2008	0,7	0,3
2009	1,3	0,6

Old goals (decrees april 2001)

year	Electricity	Natural gas
2002	0,10	0,10
2003	0,50	0,40
2004	0,90	0,70
2005	1,20	1,00
2006	1,60	1,30



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EE national targets for main distributors operating in Piedmont region: 2005

ELT

AEM Torino Distribuzione S.p.a., Torino	1263 tep
Enel Distribuzione S.p.a., Roma (dato tot.naz.)	87849 tep

Spotting the
monopsony

GAS

AES.p.a, Torino	2018 tep
Italgas S.p.a., Torino	20215 tep
Enel Distribuzione S.p.a., Roma	8324 tep



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The first phase of our project

- Interview with distributors
- Interview with ESCo
- Assessment of EE-ES potential at regional level (with the lower marginal cost)
- Field preparation for Region/Distr agreements (around project with lower mc)



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Critical issues

- Global targets are not ambitious
- Projects already realized could represent the overall target for local distributor
- Wait and see (in particular the sanction)
- Tradable?... (see next slides...)



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Tradable? /1

- A necessary (but not sufficient) condition for a good being tradable is the unequivocal allocation of property rights...
- ...so, first of all, who owns White Certificates?
- The mechanisms/conditions which entitle a subject to be owner of WhCert are not yet clear



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Tradable? /2

- Consider the phases of a EE/ES project eligible for WhCert emission:
- Idea
- Proposal/project
- Authorization/permits
- Implementation/realization
- Maintenance
- Upgrading
- Spillovers
- Finance





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Tradable? /3

- Take, as an extreme example, the case of district heating:
- Distributors bear the sunk cost of the network, maintenance and hot water production
- Final user could upgrade the system *beyond the meter* , adding absorption equipment to provide cool for indoor-conditioning



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Tradable? /4

- Trigeneneration is eligible for WhCert
- Distributors are not so happy to see WhCert flowing to clients implementing EE projects (trigeneneration) ,using up-stream costs beared by utilities



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Tradable? /5

- Moreover, WhCert could be tradable only in the following cases
- WhCert realized beyond the goal
- WhCert coming from subjects with no obligations (agreements with distributors)

In case of full “in house” compliance market simply will not emerge



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Non-conclusions and outlook

- From theory to reality there is a long way to go
- Nevertheless, more ambitious targets could foster the market instruments (EU dir on energy efficiency?)
- Facilitation and information seem necessary to the working of the mechanism



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Thank you for your attention

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Tradable? /7

- Due to the quasi-monopsonistic position of Enel distr (or electricity) , the potential market for WhCert could suffer in terms of dimension, liquidity, prices
- The case of gas seems more promising, being the market far more fragmented (Italgas holds nearly a fifth of it, Enel-gas less than a tenth)