



V international media forum on the
protection of nature
“capitalizing on the environment”

Investment scenarios in renewable energy and clean technologies

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villa mondragone – monte porzio catone
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Quick check...

How many wind mills are in Germany?

less than 2,000
more than 10,000

Does Germany produce more green (renewable) energy per person than Italy?

Yes, 2 times
No, less than half

How many liters of water per hour falling 10 meters are needed in a small hydro power plant for a kW of power?

About 500
About 5,000
About 50,000

How many hours of TV viewing with a kWh of energy?

2
20
200

... how much do we really know?

Clean tech is relevant...

- In Italy alone there are over 300 companies, employing 12 thousand people, generating €5B revenues and €2B margin
(more revenues than Fininvest)

- Wind, hydro, geo, biogas and biomass power generating facilities in Italy involve 700 comunal administrations, save imports for 40 milion barrel of oil, €3Billion.
(€50 saved per each resident, per year)

- Global investors have put \$190 Billion of their money in it: solar related stock owned companies are worth \$80B, wind €50B, biofuels \$50B, private equity has over \$9B of dedicated investment funds, carbon credit business is worth \$20B.
(the entire Milan Bourse is worth €600B)

... even if public does not perceive it yet

Stock performance...

Renewable energy index grew 250% in the last years while stock indexes grew 50% and oil 25%

In the period May to October 2007, one of the worse for stock exchange, oil price grew 20%, renewables 40%+

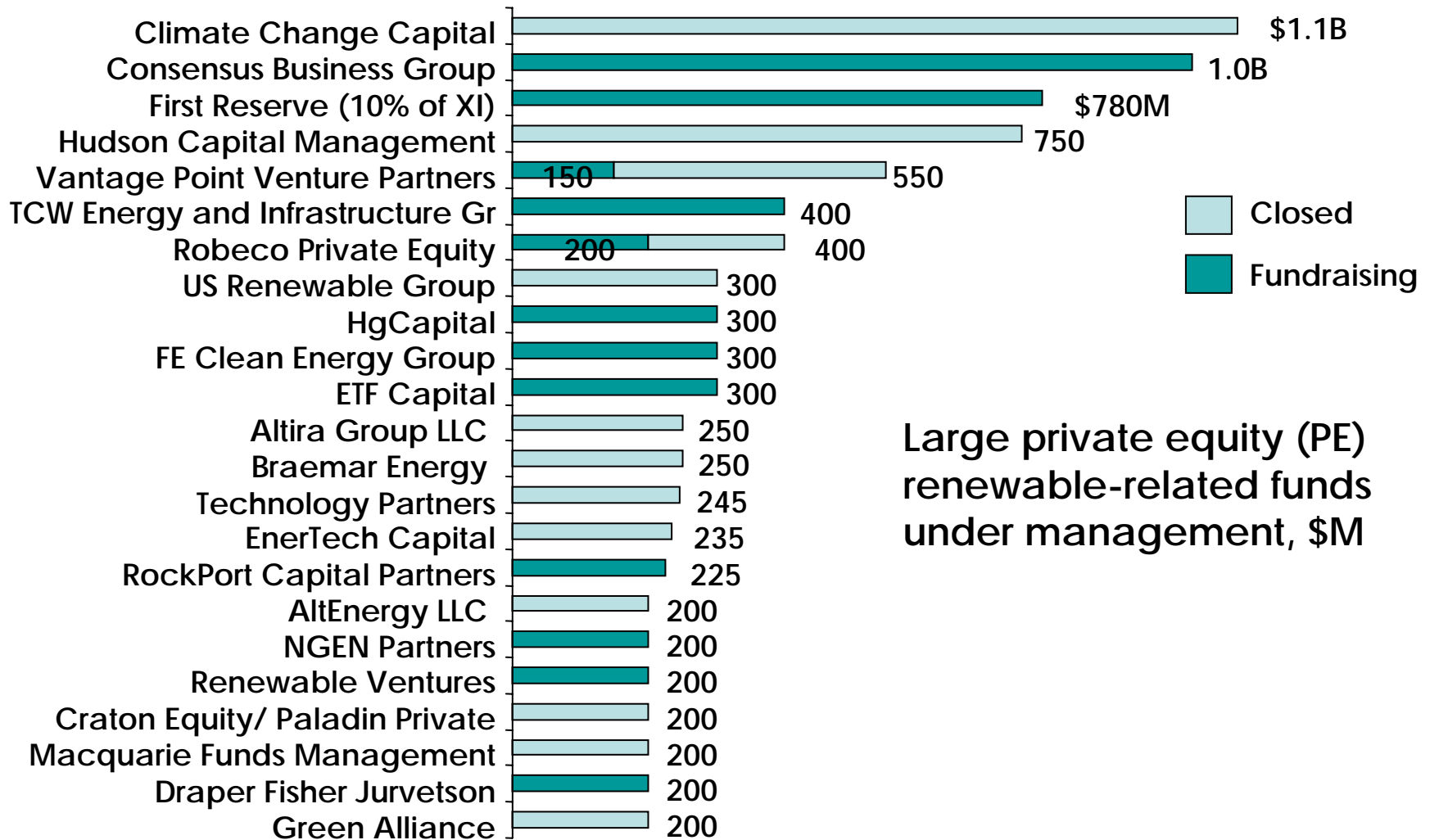
... +250% in 2 years!!!

Unaffected by stock market downturns...

	<u>May-Oct 07 performance</u>	
<u>Wind equipment</u>		
Gamesa	Spain	+18%
Vestas	Denmark	+22%
Suzlon	India	+40%
<u>Wind operators</u>		
Acciona	Spain	+31%
<u>Solar equipment</u>		
Applied Materials	USA	+1,5%
REC	Norway	+41%

... steady value growth

\$9Billion PE searching for a use...



...California's teacher's pension fund & co

Strong fundamentals...

Proper public awareness for Global warming

- Issue to stay for decades, until properly addressed
- Cross national legislation and commitments reduce single Country risks

Clean tech associated to energy resources

- diversification of supplies a key strategic issue for most Countries
- Oil & Gas in scarce supply: can only get worse

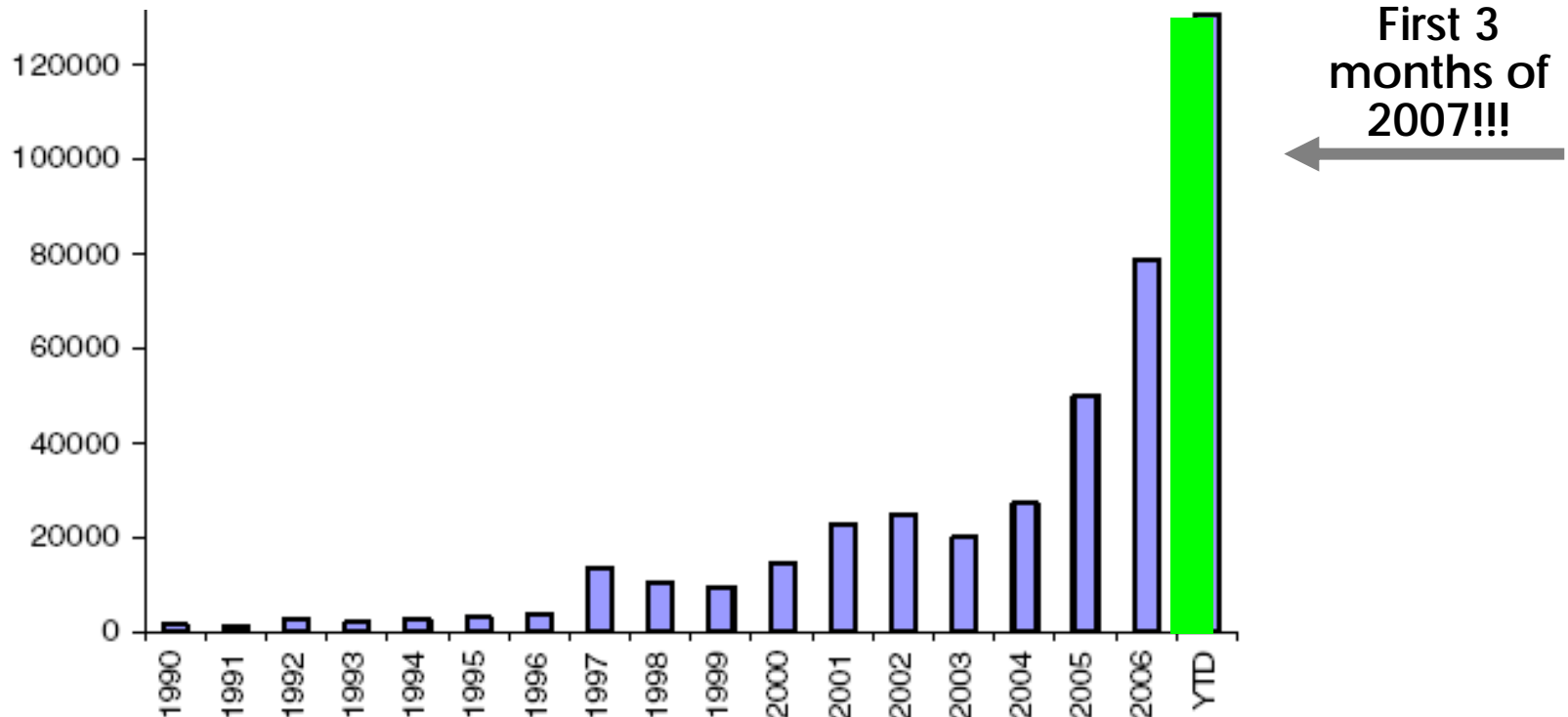
Generally clean tech equals longer lasting solutions

- Capital intensive, long term commitments

... long lasting demand

Global warming...

Occurrences that "climate" change is mentioned in english speaking press



Source: Factiva.

... a la mode, now

Known reserves...



100 years



40 years



30 years

Da: Pietrogrande, Masullo, energia verde per un Paese Rinnovabile, Muzio editore, 2003

...scarse suply, wrong locations

Raising oil price alone not the only driver ...

- Oil majors deciding new capital expenditures with long term oil priced @\$40-50/bbl
- ARAMCO considering \$100/bbl real long term value for oil reserves
- Biofuels make sense with oil over \$60-70/bbl

...for long term investors in clean tech

Clean tech is more than just renewables...

- Building management
- Quality of life
- Recreational
- Alternative transportation
- Fashion
- Design

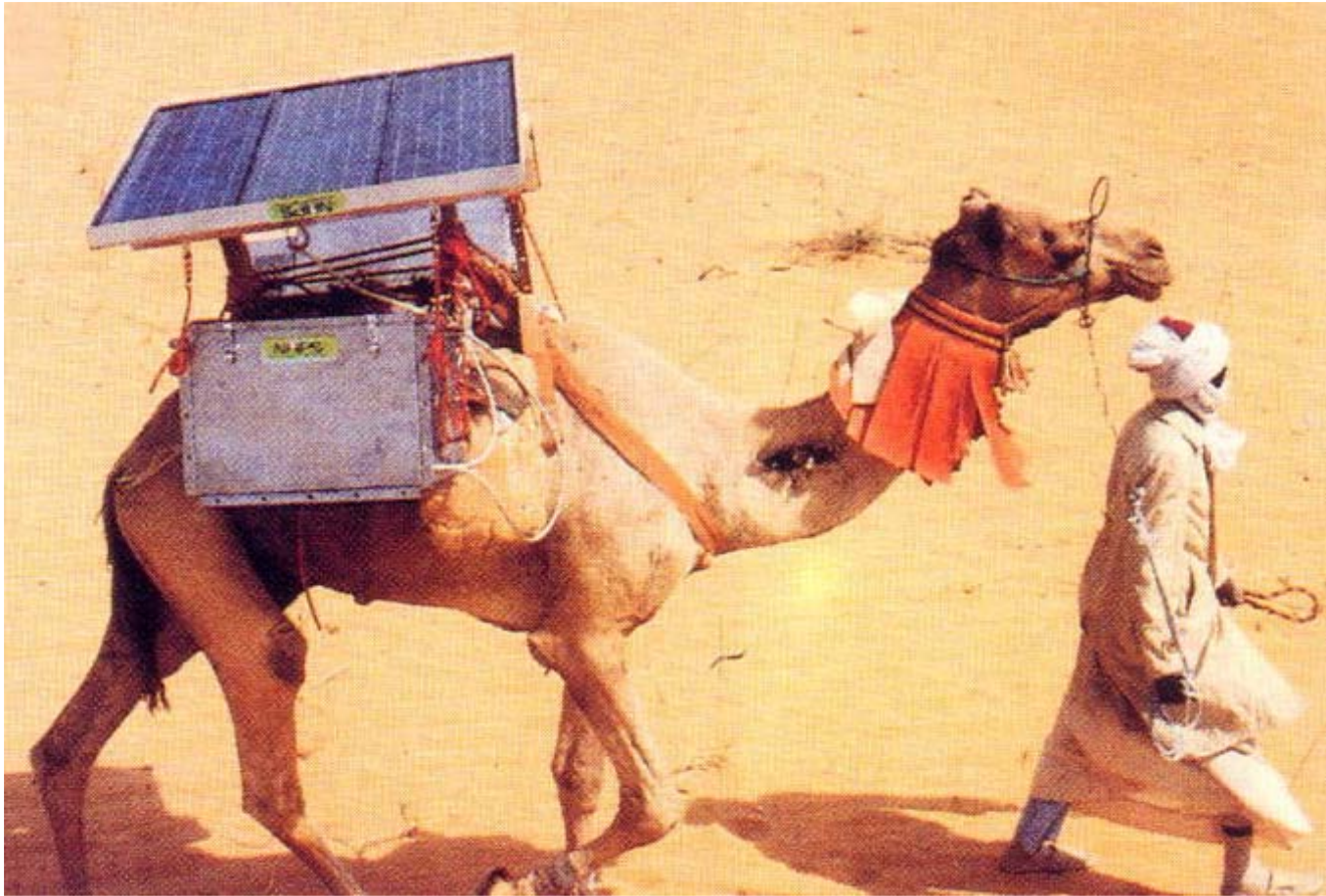
...and not just commodities

Few recent examples...



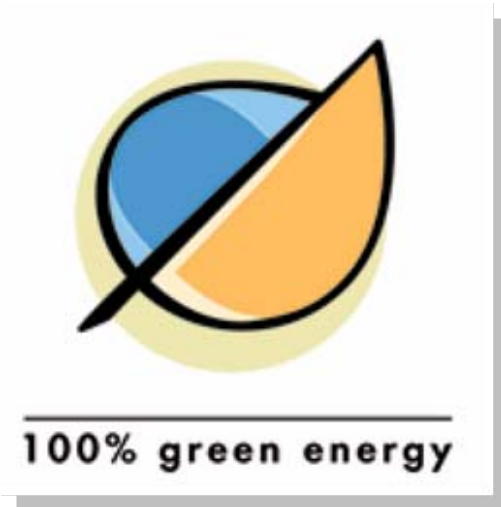
...and many more

Cost efficient vaccine delivery...



...more vaccines for same \$\$ spent

Labeling for premium product marketing...



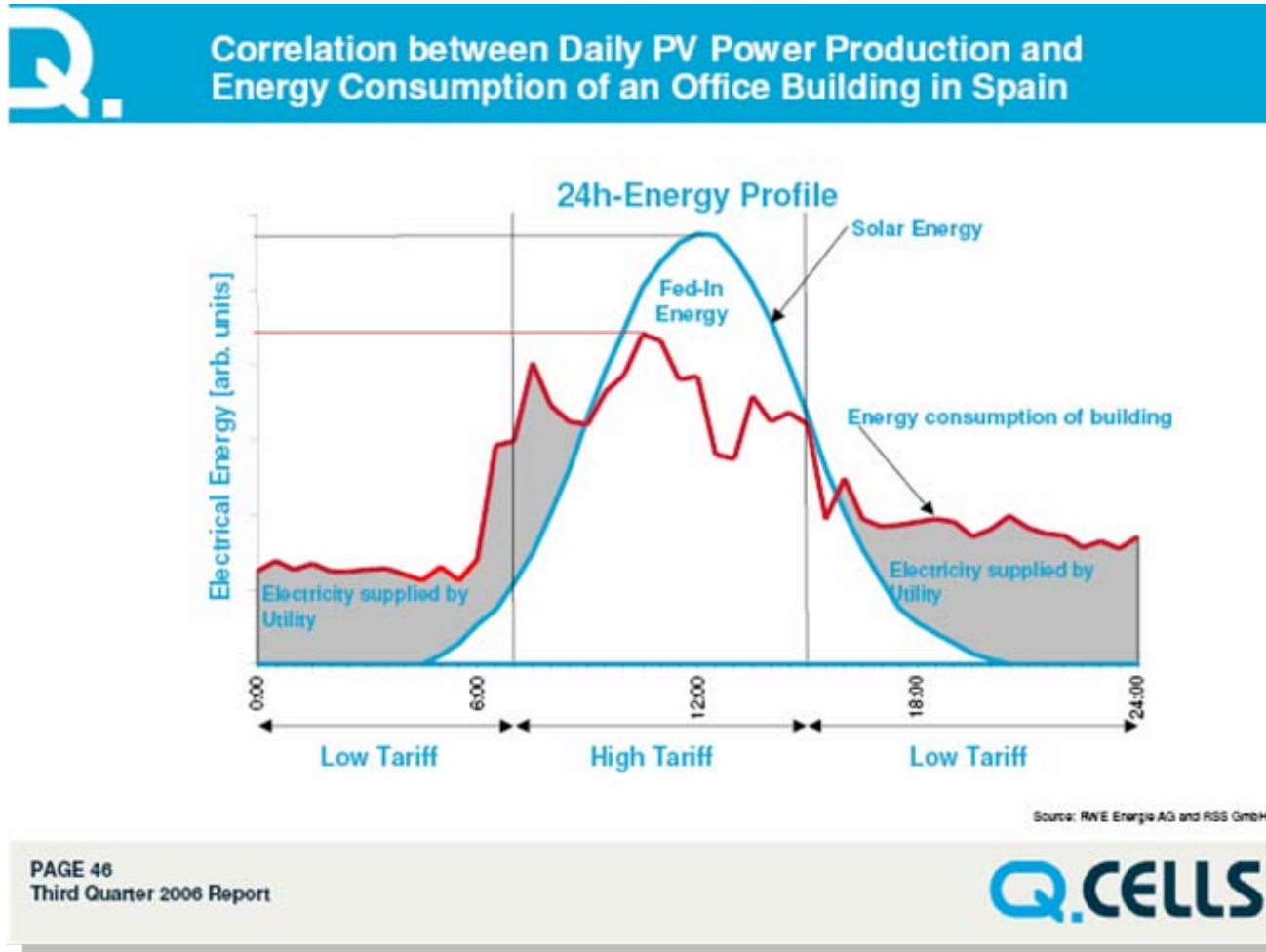
...growing buyers' interest

Largest cleantech segment still renewables

conventional base-load coal	€40-60/MWh	
mid-based combined cycle	70-100	
peakers (gas turbines)	100-300	
diesel gensets remote grids	150-250	
hydro	30-100	can be peaker
wind	50-120	cannot be dispatched
geothermal	50-80	baseload
solar thermal	200-300	peaker in most locations
photovoltaic	300-400	peaker in most locations

in some cases competitive w/conventional

ESCO* play...



* Energy savings companies

... if only there were any ESCO!

Key drivers for further growth of renewables

Mature tech (hydro, geothermal)

- Reliable tariff structure
- Regulatory frame

Wind

- Structured authorization process
- Repowering (coming soon)

Photovoltaics

- Overcoming silicon shortage
- Building integration design (culturalware)

Biofuels/biomass

- Homogenous tax framework
- Mature sustainability certification

...clear long term framework

What do investor look after?

Venture funds

people with ideas

Early stage initiatives

Early stage technologies

Private equity

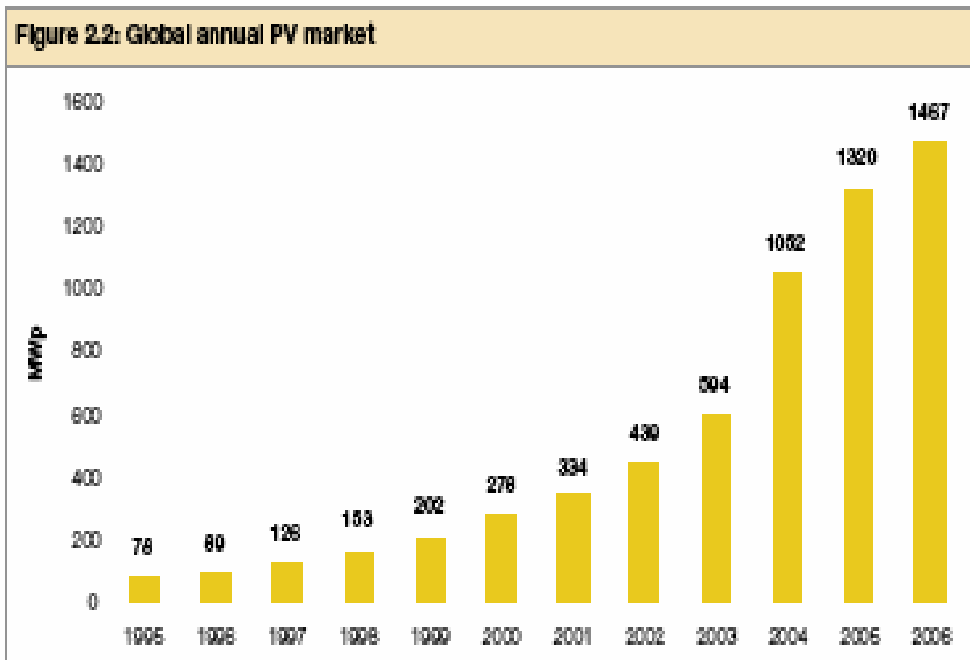
infrastructure projects
(such as wind farms)

companies that operate
with success but need to
fund growth

Management teams who
have identified a business
oportunity but lack \$

... entrepreneurs

Need capable leaders to manage growth



- Industry growing 20-40%
- few executives have more than 5 yrs tenure in the business
- Industry as relevant as automotive or airlines, but to date no global leader has moved to manage it

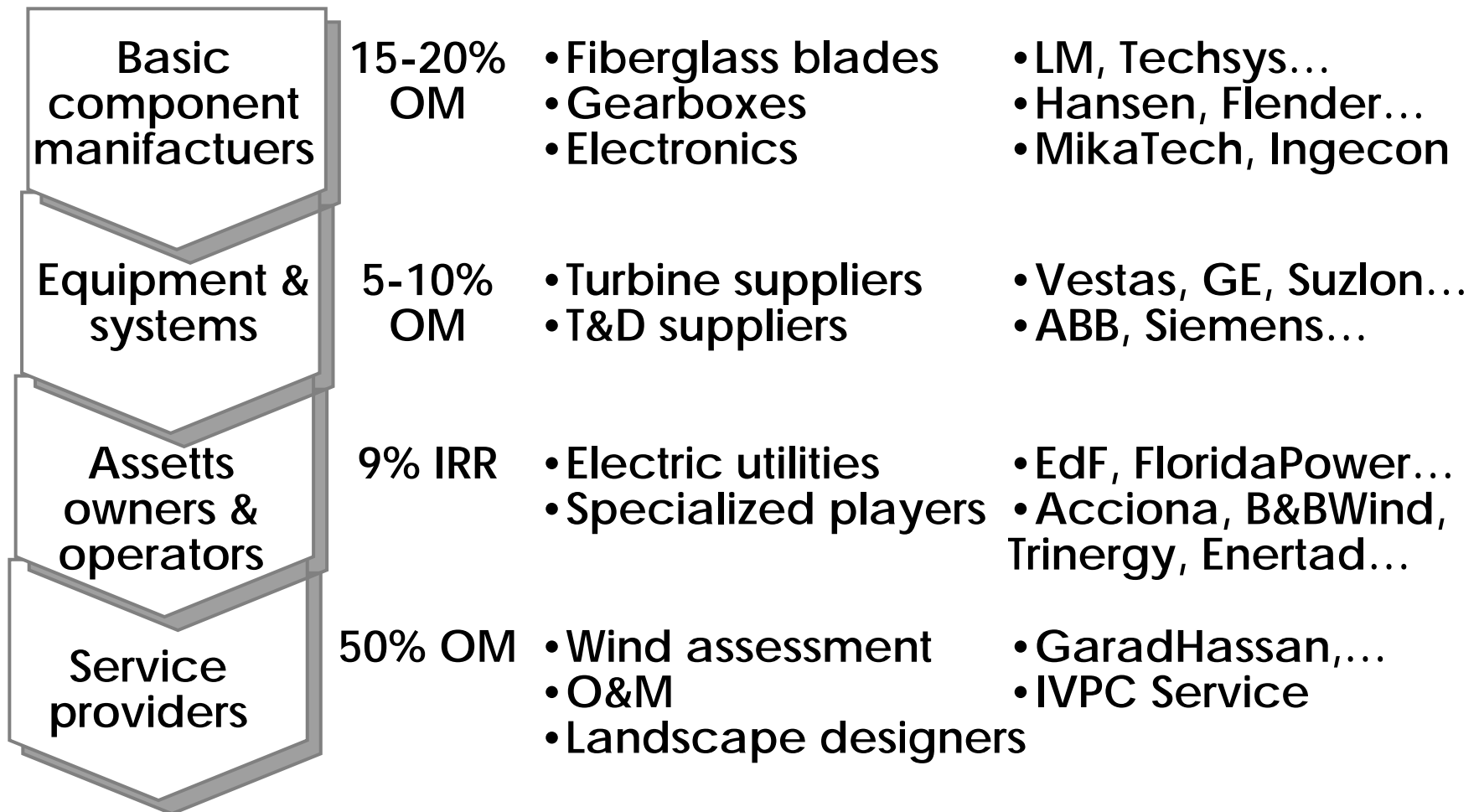
... right leaders the resource most needed

What turns down investors?

- Unstructured ideas
- Unclear target results
- Too many ideas at once
- Uncommitted entrepreneur
- Confused business strategy
- Unclear go-to-market approach
- Underestimated capital requirements
- Reliance on public funding/incentives
- Unreliable government policies/regulatory framework

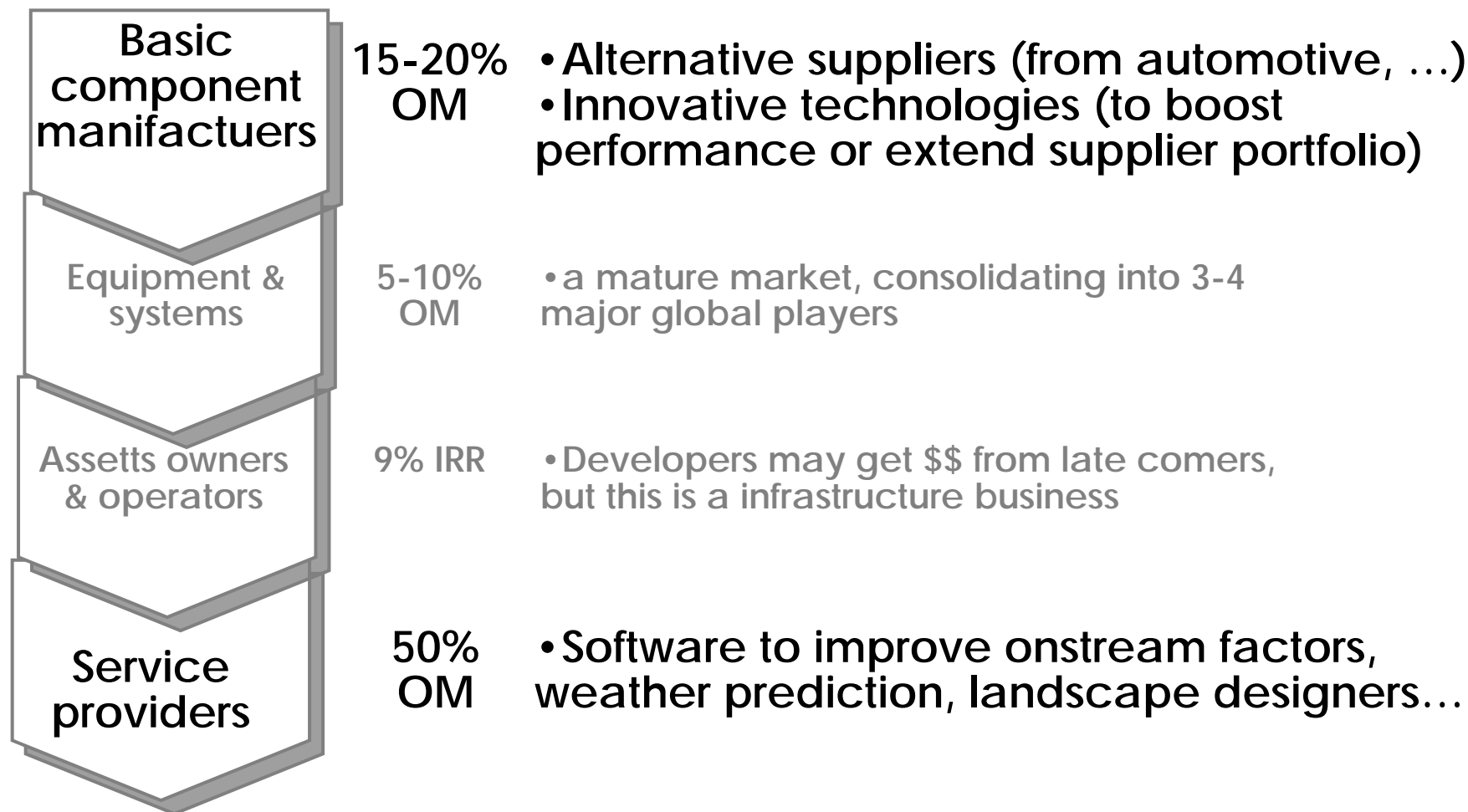
... above all: lack of personal commitment

Segmenting to understand: wind business



... not just turbine manufacturers

Areas of interest for venture capital



... plenty of valuable opportunities still open

Italy had unique competences

Finmeccanica

- Solar: ANIT, PV contractor for world's largest PV power plant (ENEL's serrePersano)
- Wind: world's first multimegawatt Wind Turbine, 1996 (ENEL's Altamura)
- Gas Turbines: Siemens' most valuable licensor for V64
- Geothermal: 50%+ market share for geo steam turbines up to 2000
- Recip engines: GMT a major global supplier of high performance marine engines

left mkt in 2000, now in Italy a €200M/yr business, growing 50%/yr

left mkt in 1996, now WTG is a €12B/yr business

left mkt in 2003, now GT is a €20B/yr global business

Now a minor global player

Sold in 2000, mkt grows 10%

Eni

- Solar: Eurosolare, main cell producer in Europe in '80s
- Biofuels: Biogas demo cogen in Monterotondo, 1981

Now 0,2% global market share, on €4B/yr market

exit, now a €1B mkt

RivaCalzoni

- Leading small hydro turbine manufacturer in Europe up to 1990s
- Early wind turbine manufacturer, 1990s

exit, now a €12B/yr mkt

exit, now a €12B/yr mkt

Fiat

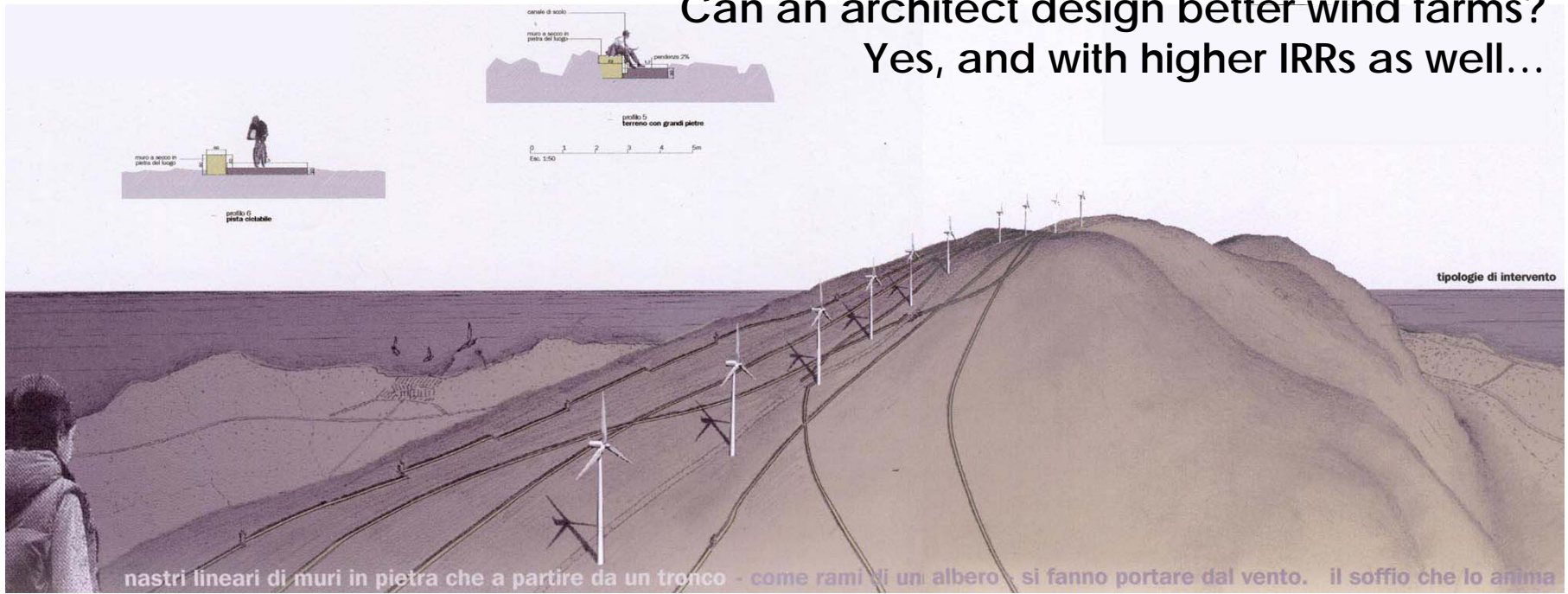
- Introduced Totem cogen systems, derived from massproduced automotive engine design

exit, now a €8B/yr market

... & poor management

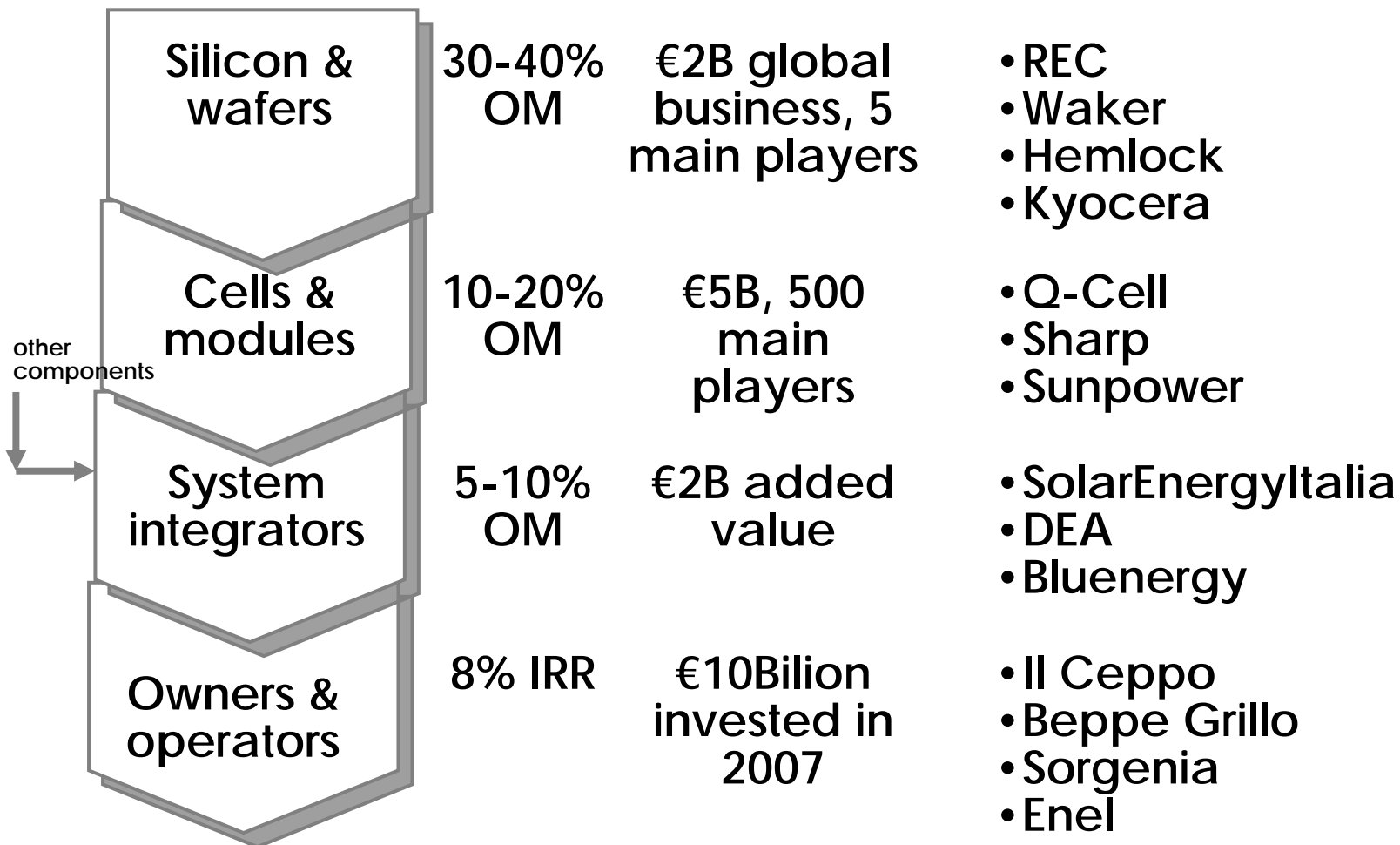
Yet unexploited resources do exist...

Can an architect design better wind farms?
Yes, and with higher IRRs as well...



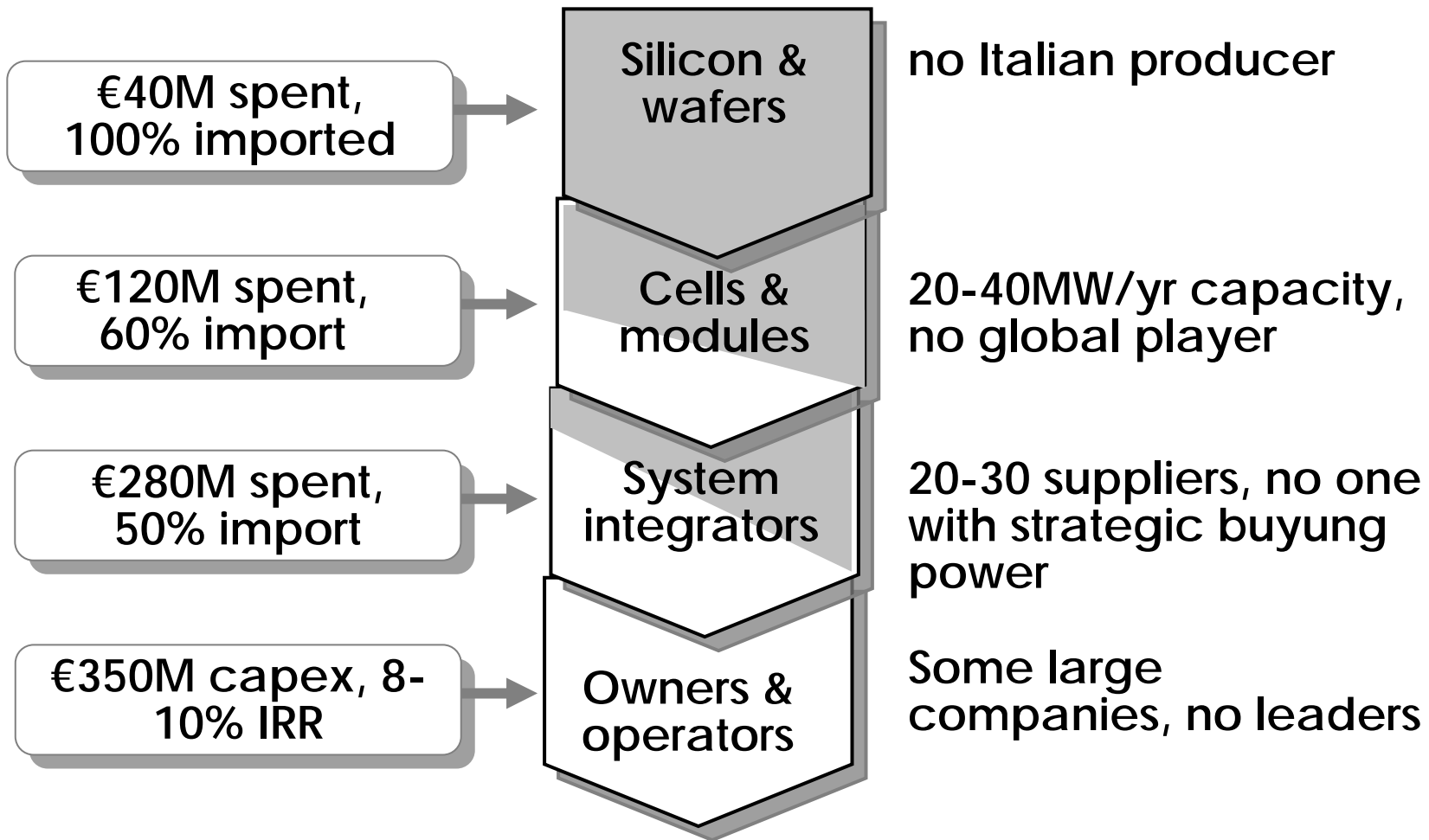
... in Italy, thanks to our "culturalware"

Segmenting to understand: solar business



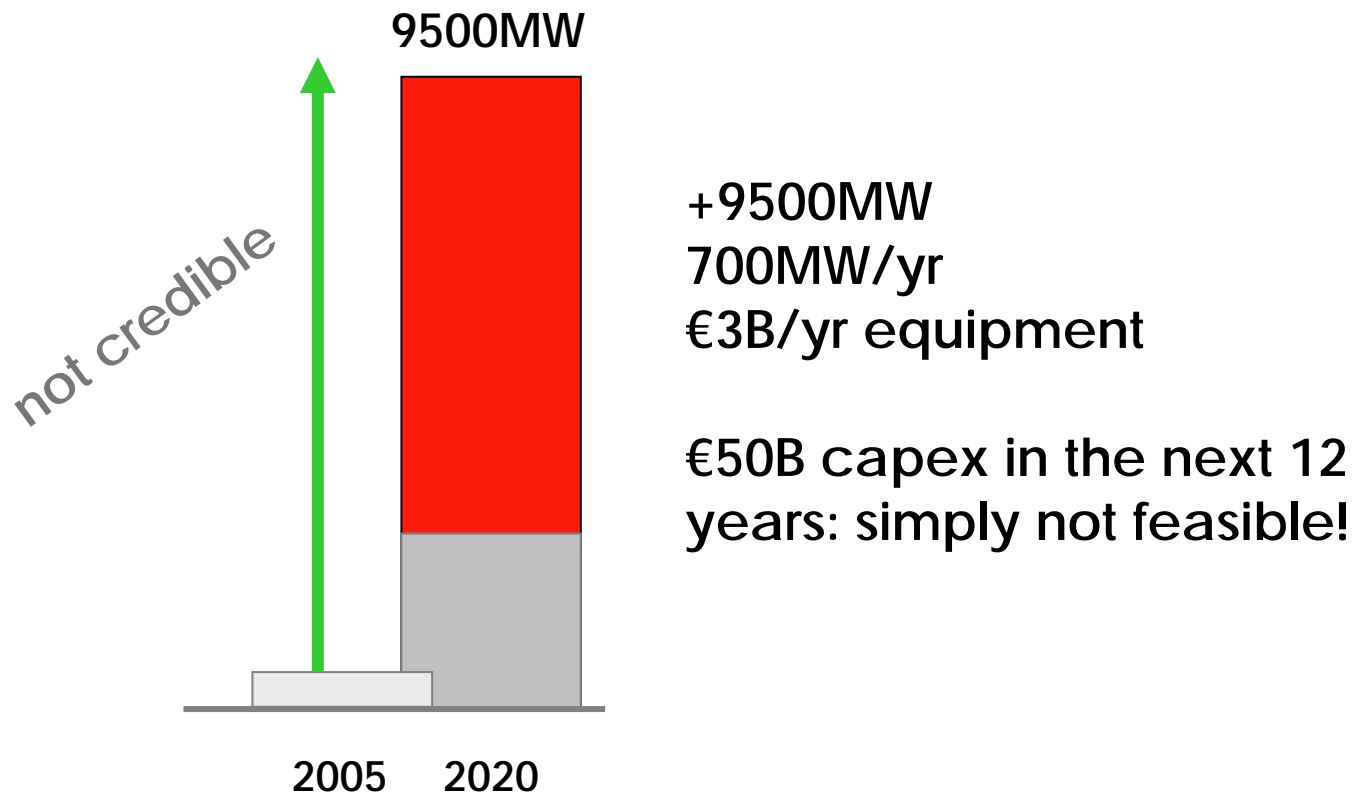
... back to fundamentals: raw materials

Italy is a real market, 80MW exp in 2008...



... investing €350M, importing 70% of it

Unrealistic government 2020 PV targets...



Source: Presidenza Consiglio dei Ministri, position Paper, September 2007

... scaring investors off Italy, (as usual)

Unrealistic, scaring investors off...

It takes few phone calls to investors, industry leaders, stock analysts to figure it out that the Government has simply underestimated the business consequence of their announcement

But not one newspaper raising a bit!

... is it politically not correct for journalists to do sanity checks on global warming news?

Where are clean tech \$\$ needed...

	Traditional strenght in Italy	Barriers to market entry
Hardware, technology	-	+++
Software, services	+	+
Culturalware	+++	none

... to turn it into a key Country advantage

Late entry investing opportunities...

	entrepreneurs	law makers institutions
Hardware	<ul style="list-style-type: none"> • Components (ie inverters, regulators, gearboxes, a-Si manufacture) • Biodiesel refineries • Premium price applications 	<ul style="list-style-type: none"> • Incentives for energy efficiency and biofuels. • Advanced dual layer thin film tech
Software	<ul style="list-style-type: none"> • Wind turbine O&M • Geologia avanzata per prospezioni geotermiche • Weather prediction • Carbon trading 	<ul style="list-style-type: none"> • Advanced geothermal prospecting • Sharing military wind data to accelerate site screening
Culturalware	<ul style="list-style-type: none"> • Wind farm landscape • Eco-labeling • CO₂ certification 	<ul style="list-style-type: none"> • Innovative landscape legislation

... if Italy wants to capture some value

My personal meter to monitor maturity...

Mature tech (hydro, geothermal)

- Turbine utilizing Vajont water flow
- Naples wastewater treated by geothermal injection

Wind

- Second generation repowering on best sites
- Best architects racing for wind farm design

Photovoltaics

- Off the shelf PV windows
- Portable off the shelf dc refrigerators (& camels optional)

Biofuels

- 5% yatrophia based biodiesel in my trunk
- Azimut 30meter motoryacht with biodiesel fuel and PV generators

Energy saving

- My daughter to shut down lights when she leaves her room
- A convenient car sharing parking next to my home

... then I may focus on something else

summary...

- Clean tech and renewables is a mature market: structured global players and knowledgeable capital markets
- Plenty of \$\$ available, shortage of brains
- Little need for public R&D funding, much stronger need for reliable regulatory framework
- Investors' opportunities lay in components, tech improvements, services, culturalware

... need somebody to tell the story right!