



ASrIA -  
Association for  
Sustainable &  
Responsible  
Investment in Asia

July 2009

# SAM at a Glance

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- Asset management company founded in 1995
- Powering Dow Jones & Stoxx Sustainability Indices since 1999
- Headquarters in Zurich, Switzerland
- Servicing a global client base
- Over 90 employees
- EUR 7.4 billion assets under management and advice (as per 31.12.2008)
- Member of Robeco (part of AAA rated Rabobank Group)



# Agenda

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- **Solar: Various Regions**
- **Trends for Solar**
- **Batteries**
- **Electrical Grid**
- **Efficient Lighting**

## China: Renewable as the Answer ...



Source: SunPower

- ~ 60 000 demonstrations in 2008 due to Air Quality
- Air Quality as the Biggest Source of Contestation
- China 18 out of the 23 worldwide most polluted cities
- China: 1GW of new Coal Capacity each 5 days  
→ 80 GW each year = The UK Power Generation
- Commodity Security as a key politic driver in China

# China: Preparations for the Green Battle have started



PV system for the Beijing 'Bird's Nest' 2008 Olympic Stadium  
130 KW



- China to introduce Solar Subsidies ~USD 2 per watt
- Applicable for systems over 50 KW
- Local Provinces will add further incentives to this
- USD 650 billion dollars spent over the next 10 years in Renewable Energy
- Solar installations would grow from 30 MW as of today to 20 GW in 2020

# Provinces are Adopting Solar as Well



- Jiangsu announced a solar program
- 400 MW over the next three years - IRR Compelling
- Competition between provinces: the coal problem
- Other province such as Shanghai, Shandong and Zhejiang could get in as well

Coal Resources in China



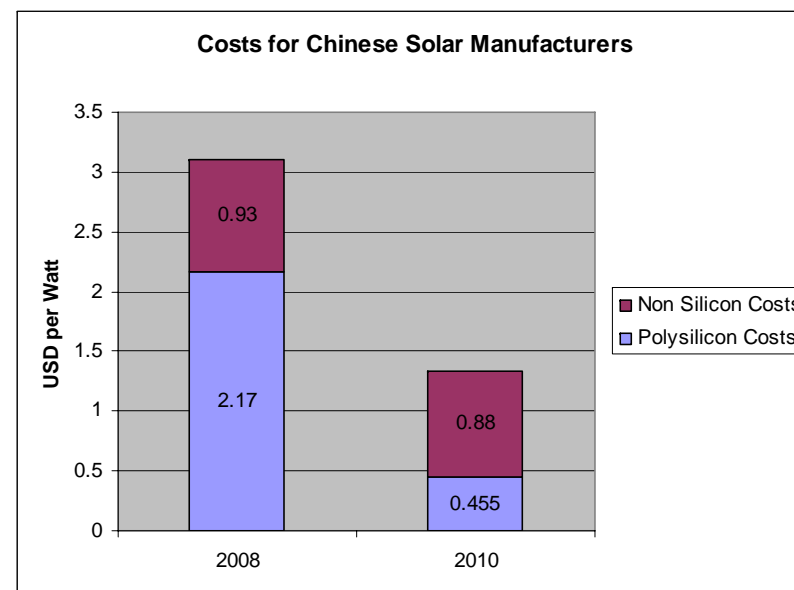
Source: Coal Infomine

**China Already Ready for the Battle ...**



# Prices Down, Margins Up ?

- Polysilicon Spot Prices from USD 400 to USD 70
- Before Chinese had Polysilicon on the spot as they entered the market after the Europeans players
- Chinese players are securing their polysilicon supply
- Chinese have considerably less non polysilicon costs
- Top Tier Chinese have top quality and are used for project finance in Europe
- Technology is improving very fast



Source: Company reports, SAM Estimates

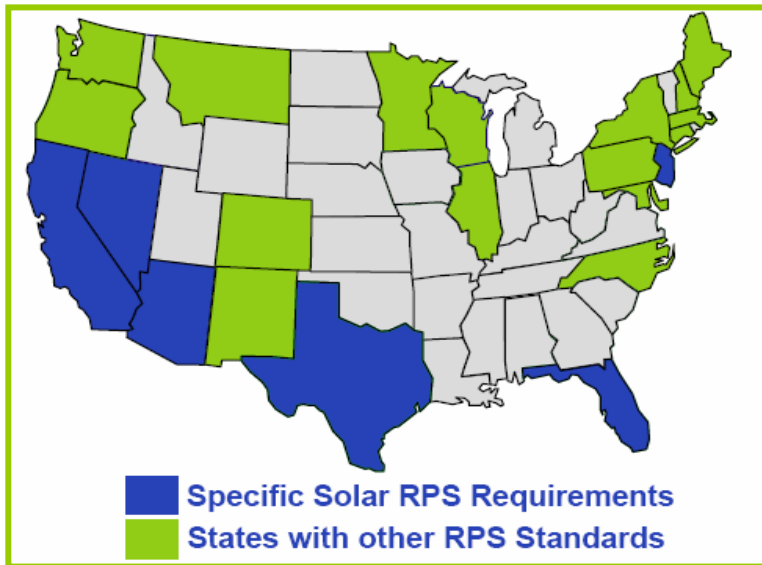
## Chinese Solar Players: Long Term Winners ...

# An Urgent Need for Renewables in the US



- Coal is 52% of US electricity Generation
- Plants are inefficient and Old (35 years on average)
- Banks Refuse to finance Coal Plants
- Utilities cannot do nuclear investments
- 28 states do have Renewable Portfolio Standards.

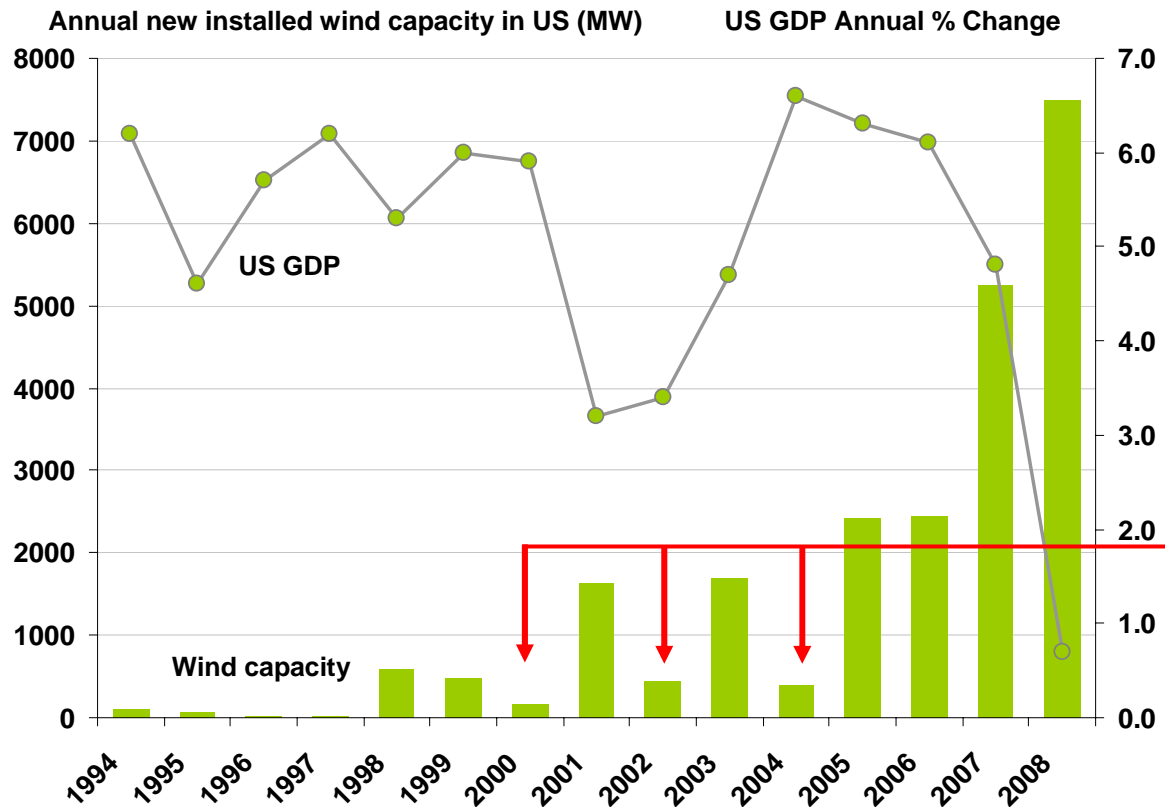
***Obama pledges on Renewable Energy to save the day***



- Job Generation
- New Energy Bill, Federal RPS expected
- Utilities start investing

***The US have to take part of the battle ...***

# Renewable Energy: Protected by Regulations



Source: BEA, BTM, Make Consult, SAM

## Legislation more important than GDP

- Example: US PTC extension history
- Similar situation in other markets
- PTC/ITC extended lately

Example: US new wind deployment stopped in 2000/02/04 as production Tax Credits were not extended

# Europe To Remain a Leading Player in Renewables

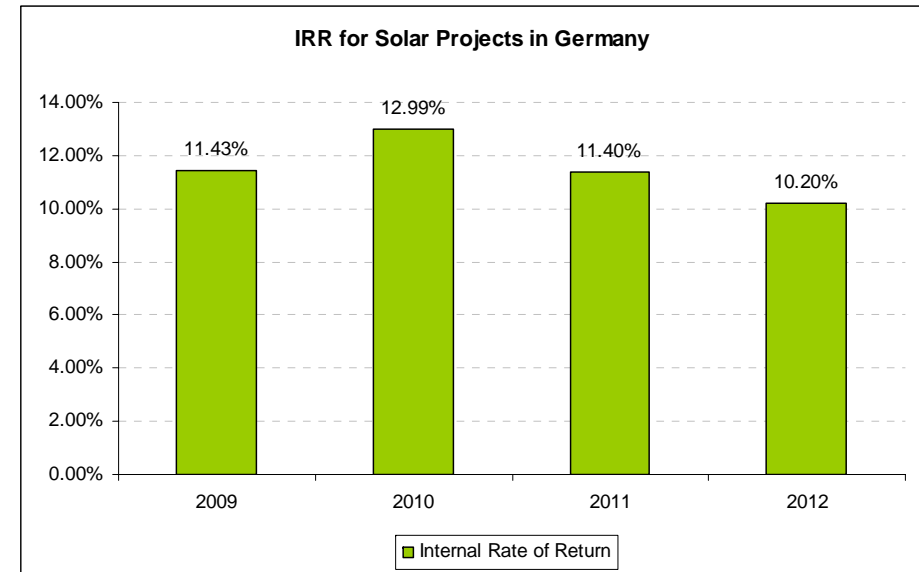


## A continued support from legislators

- Feed-in-tariffs are attractive and allow 11-13% IRR
- Longer term, real driver is the renewable target (20% by 2020)
- Grid Parity in Italy in 2010, 2012 in Germany

## ... Followed by New Players

- Best in Class utilities in term of Renewable Energy
- Banks strongly committed to Renewables
- Insurance & Pension Fund to enter the game

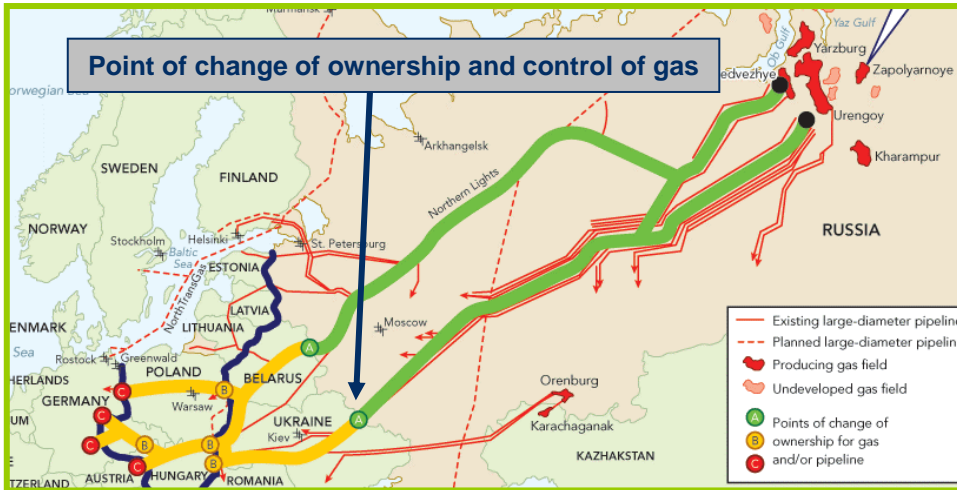


Sources: SAM Estimates

*Europe wants to lead the battle ...*



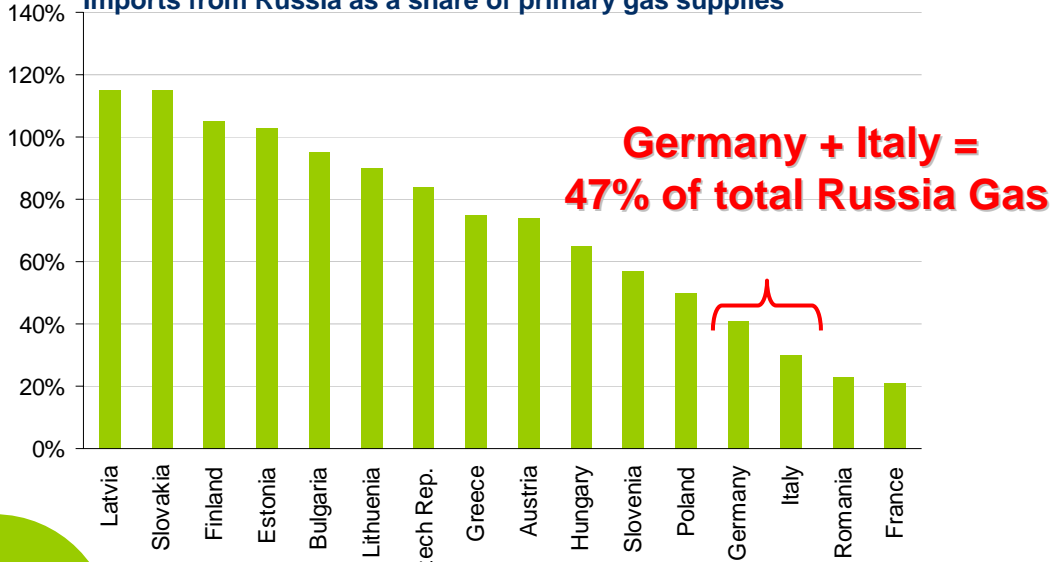
# Europe's boost due to Energy Security



## Supply Security

- Europe gets a cold awakening
- Europe increasingly dependent on Russia
- Russia increasingly independent of Europe

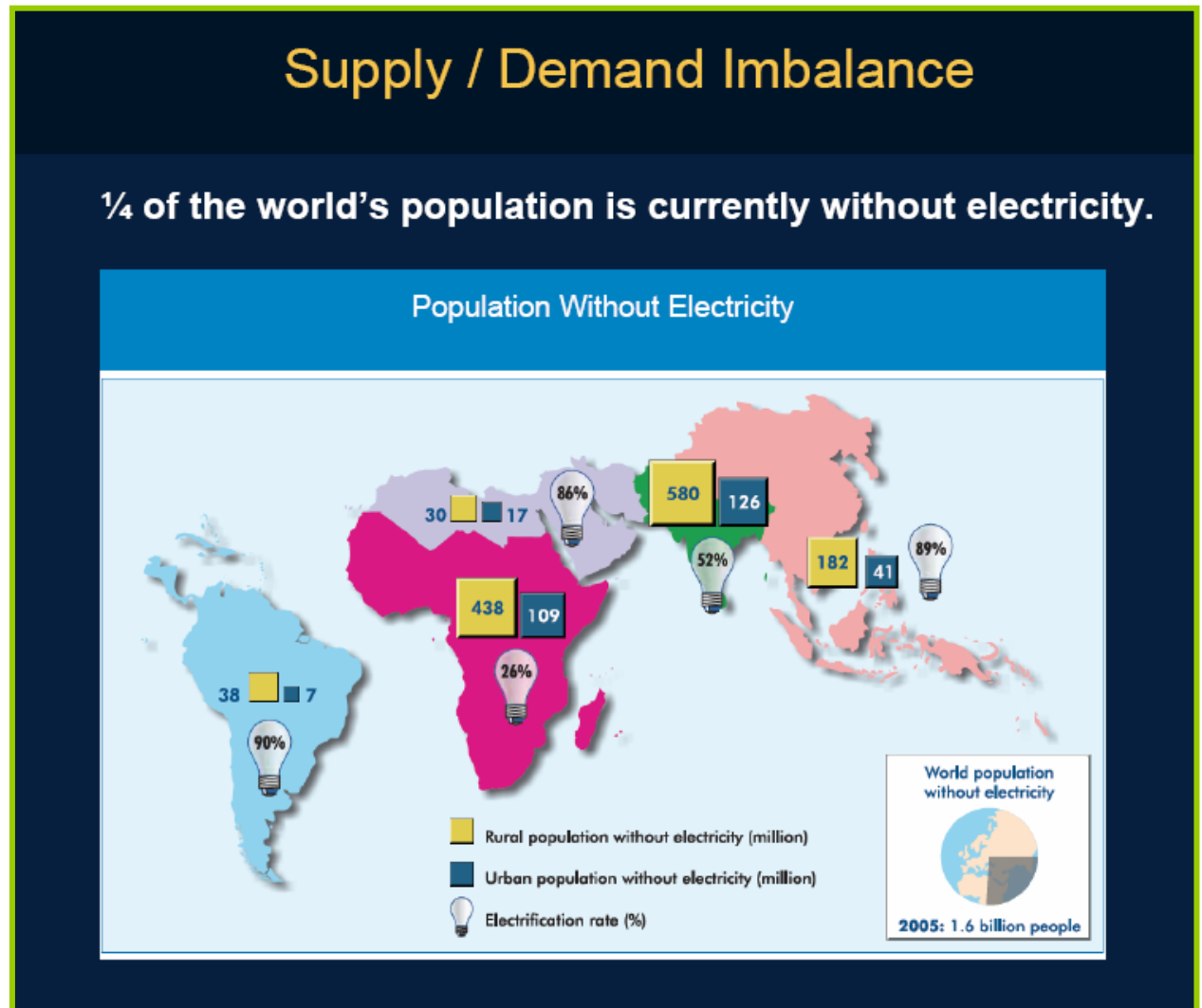
Imports from Russia as a share of primary gas supplies



# Longer Term: Why Solar will Power the Developing Countries?

- Low electrification rates in Africa and India
- High solar radiation in those regions
- Full electrification would cost billion
- Solar can be a “plug and light” solution

*Just like the telecom industry, we expect emerging markets to leapfrog conventional electricity sources and invest heavily in solar power*



Sources: IEA. SAM

# Rising Unemployment: Clean Energy at the Rescue?

Unemployment Rate of the US since 1970:



Source: Bloomberg

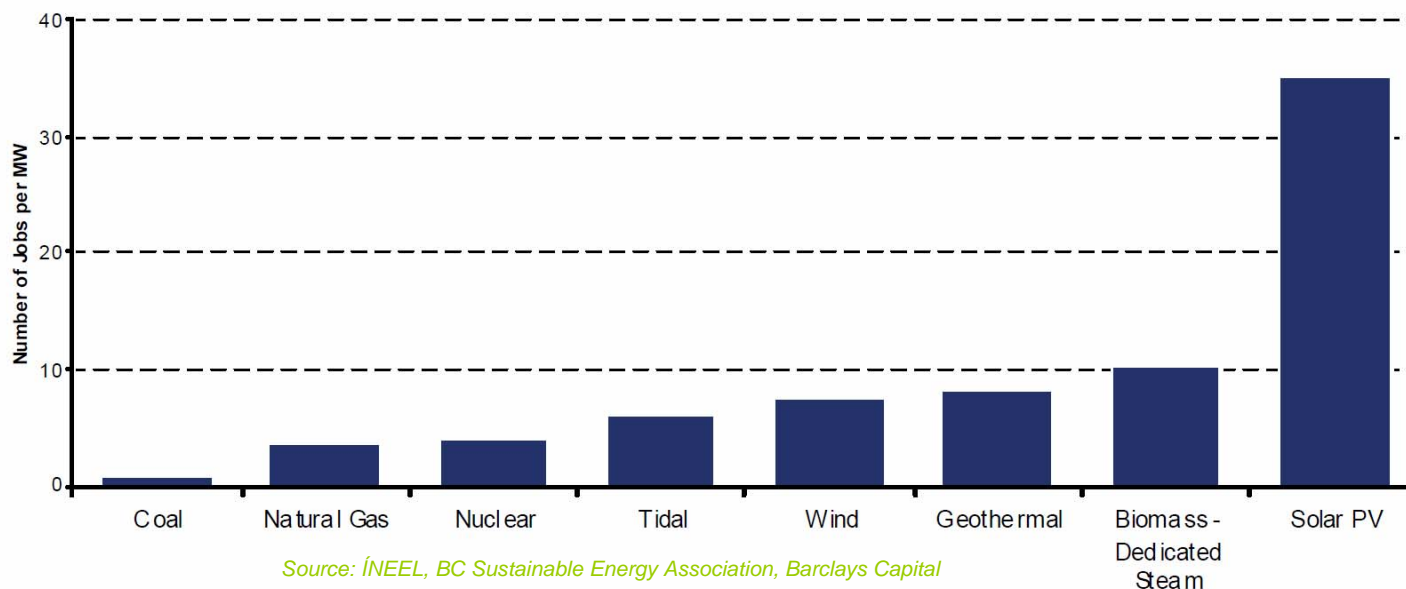
## GOING GREEN:

Besides the big macro drivers **ENERGY SECURITY** and **CLIMATE CHANGE**, another aspect is gaining big importance:

*...The Big Job Creation Potential ...*

# Renewable Energies: An Employment Battle?

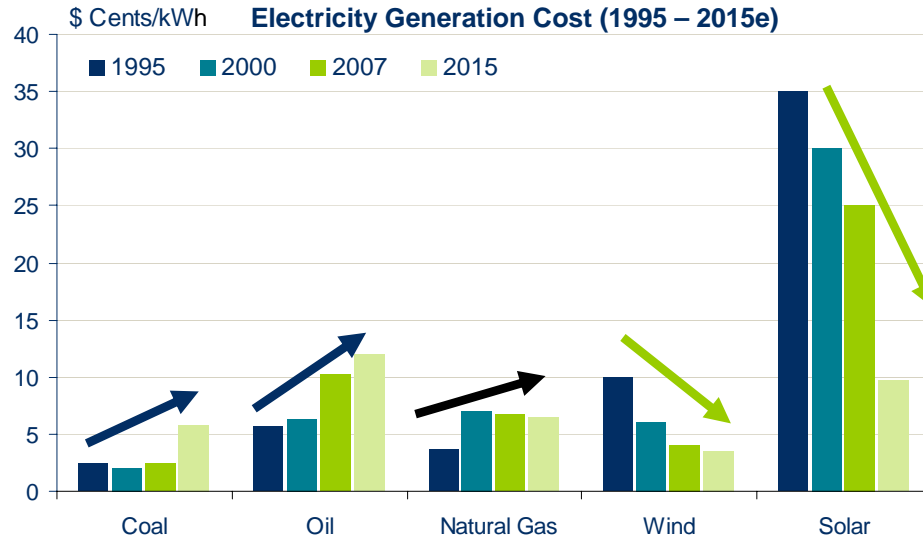
Job Creation Potential of Various Electricity Generation Technologies:



- Higher labor costs in renewable energies but no fuel costs
- If annual solar production is at 300GW/a (2030e), then 5mio jobs are likely (mostly installers)
- Jobs mean ... taxes and return on investment for governments

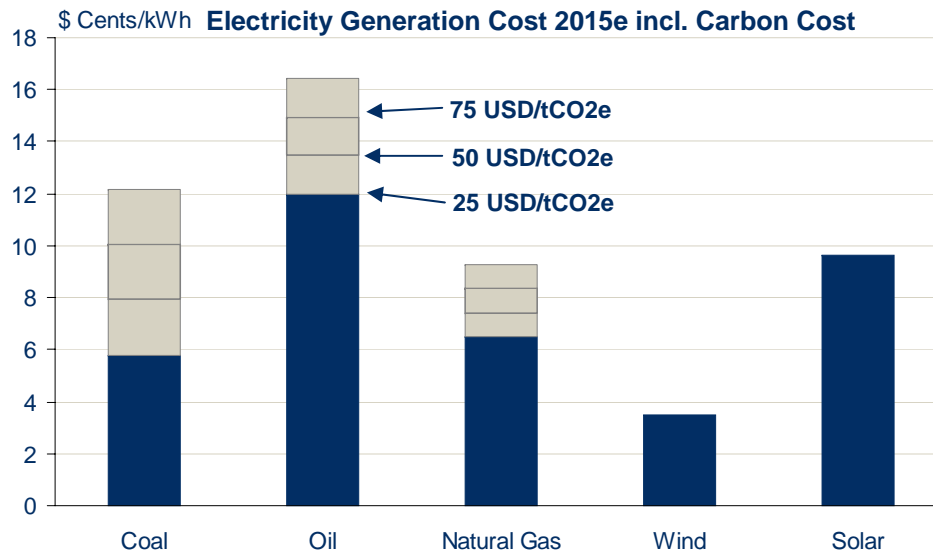
**Renewable Energies Are Creating Jobs ...**

# Global Trend Analysis – Costs Up...Costs Down...



## Cost of energy

- Continued regulative support
- Cost of energy coming down
- Cost of carbon internalized

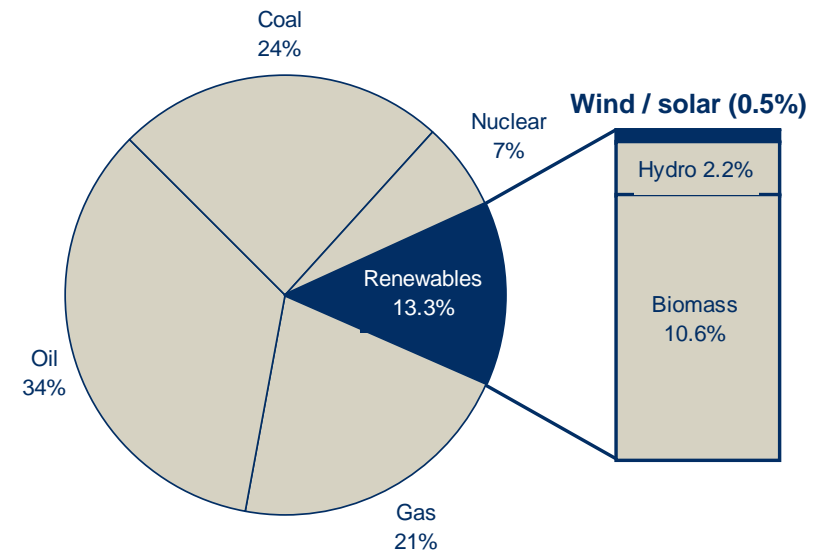


**Carbon Cost inclusion is the wild card ...**

# Solar : A Growth Story

*While some analysts would argue that Solar Power is growing too rapidly, we would like to put the numbers into perspective.*

- The world consumed 18 trillion kilowatt hours of electricity in 2007.
- **Total Installed Capacity for Solar ~ 15 GW ~ 0.1% of the total electricity consumed in 2008**
- Total Solar installation ~ 18 coal plants (3 months of China installations in new coal plants)
- Main Goal is **20% Renewable by 2020**
  - Difficult to add Hydro (geological reason)
  - Biomass could decline



Source: SAM, IEA

*It's only the beginning of the growth ...*

## Solar : Lights all Green ...

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- Rising Energy Demand
- Energy Security
- Support from Government
- Attractive Investment (IRR)
- Technology is improving



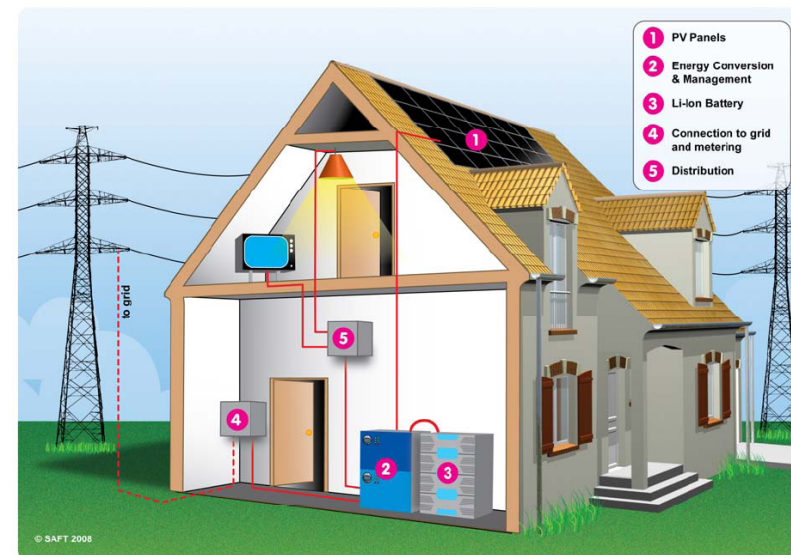
***Solar: A Promising Long Term Investment***

# Batteries: Powering Tomorrow

- Stabilization of the electrical grid.
- Uninterruptible power supply for applications in telecommunications, IT, hospitals...
- Consumer electronic devices.
- Hybrid electric vehicles.



The role of energy storage in renewable energy systems



Example of residential PV system with energy storage

**Considerable amount of money is spent on R&D for Energy Storage ...**

# Renewing the electrical grid

- The electrical grid in the US is in terrible shape:
  - 30 years of underinvestment
  - 70% of lines are over 25 years old
- The transmission losses doubled to 10% over the last 30 years
- Increase in Renewable → Need for Investment



⇒ Necessary Investments over the next 20 years: USD 2 trillion

⇒ This compares with \$10bn investments in 2010e.

***Transmission is a necessary fight ...***

# LEDs: THE Smart Lighting

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- Standard for Mobile Phones (50% of the market)
- Steady growth in the automotive and signs market (each 15% of market)
- New drivers in Notebooks, and LCD-TVs
  - NBs: 30% penetration rate in 2009, 90% in 2011e
  - LCD-TVs: 2% penetration rate in 2009, 15% in 2011e
- Huge potential in the general lighting market
  - Incandescent bulb lamp banned worldwide
  - Common China-Taiwan projects on street lighting
  - Lighting fixtures market \$100bn (comparison: LED market 2009e: \$7bn).



Source: Apple.com



Opto Tech's Project in Beijing, China

# Do you want to miss the Green Battle?

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## Global fiscal stimuli packages targeting Renewable Energy:

- China strategically introduces feed-in-tariff for solar energy.
- US to introduce a federal RPS plan, want to decrease emissions and introduce Cap and Trade system
- Europe: Copenhagen is coming, CO2 is a concern, European commission calls for an increase in Renewable Targets

## Energy Storage & Grid: Two key points for Renewable Growth:

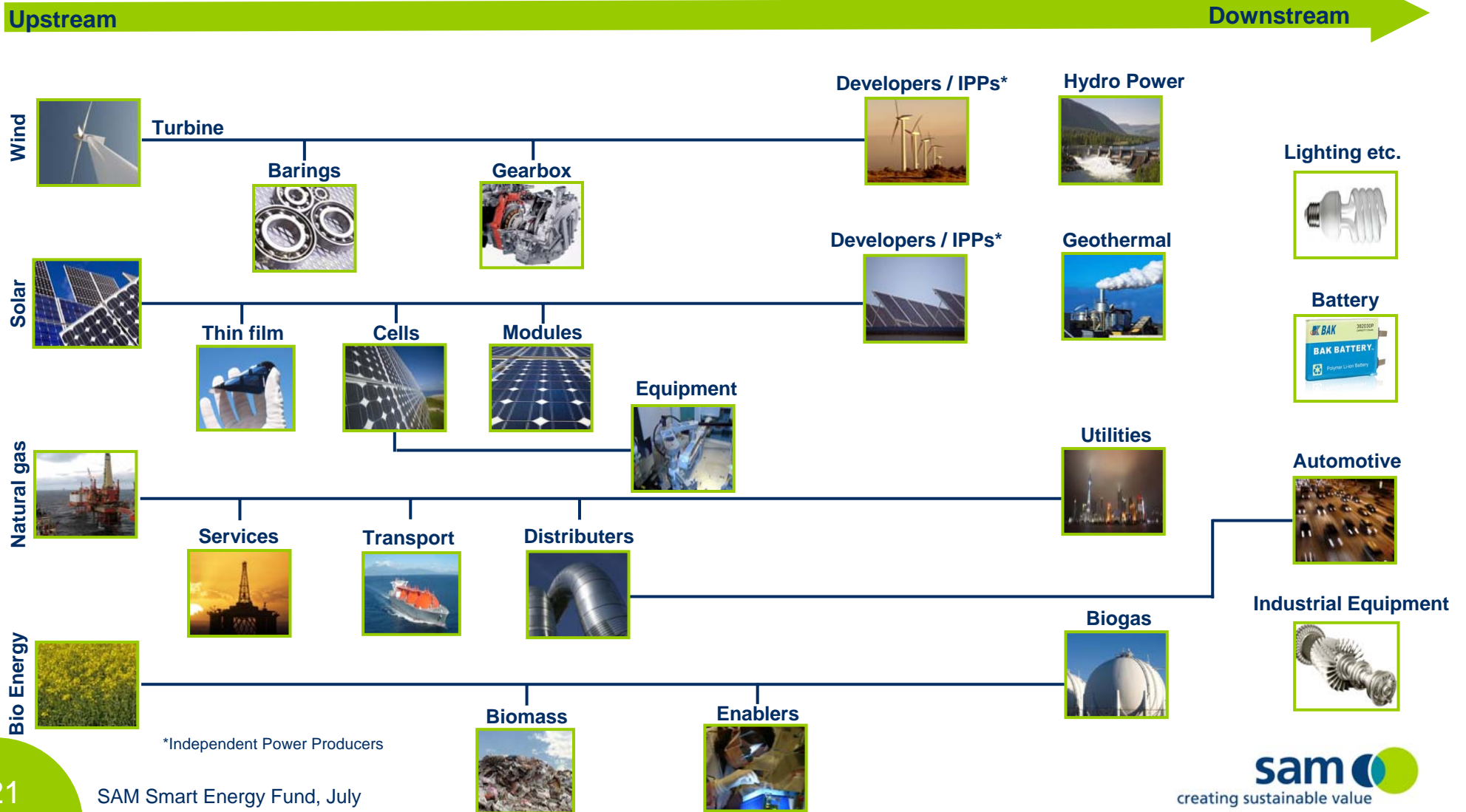
- Cost Effective Energy storage is needed for Renewable Growth
- Grid needs to be extended to support Renewable Growth

## LED, THE Smart lighting:

- Ban of Lighting in Europe
- Taiwan costs going down

# Investment Universe Construction

Investing in companies along industry value chains, from upstream to downstream to suppliers



# Investment Universe

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## Renewable Energies

- Wind Energy
- Solar Energy
- Alternative Fuels
- Hydro & Geothermal Energy

## Distributed Energy Systems

- Energy Conversion Technologies
- Power Electronics
- Batteries

## Natural Gas

- Exploration and Production
- Natural Gas Services
- Gas Utilities & Distribution

## Demand-side efficiency

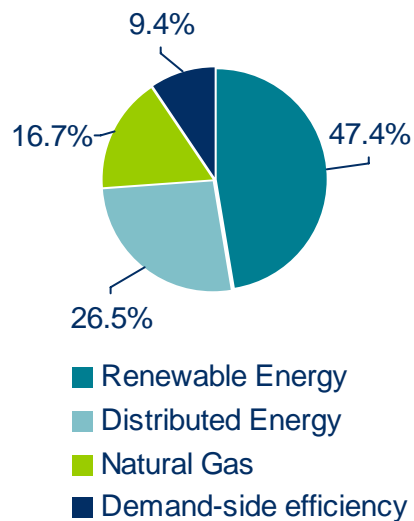
- Mobility
- Industrial Processes
- Building & Facility

# Portfolio Characteristics

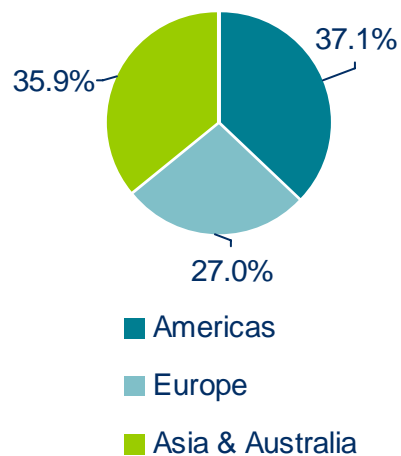
## SAM Smart Energy Strategy (in USD, as of May 31, 2009)

Key Data: SAM Smart Energy Fund	
Inception Date	September 23, 2003
Total Fund Volume in USD (in m)	325
Total Strategy Volume in USD (in m)	n.a
Number of Holdings	48

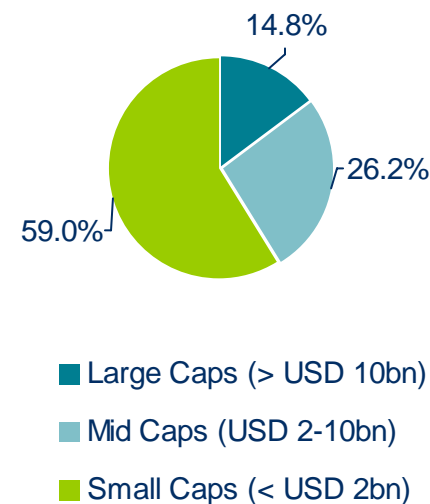
**Exposure by Clusters**  
(excluding cash)



**Exposure by Regions**  
(Company Domicile, excluding cash)



**Exposure by Market Capitalization**



# Investment Team

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## Portfolio Management Team

### Thiemo Lang, PhD

- Portfolio manager of the SAM Smart Energy Fund since 2007
- In portfolio management since 1999
- Joined SAM in 2007

### Dieter Kueffer, CFA

- Deputy portfolio manager of the SAM Smart Energy Fund since launch in 2001
- In portfolio management since 1989
- Joined SAM in 2001

## Research Team

### Bjørn Tore Urdal

- Coordinator Energy Research
- Master of Science in Environmental & Resource Economics
- Analyst experience since 2000
- Joined SAM in 2004

### Jean-François Meymandi

- Master in Business Administration
- Analyst experience since 2007
- Joined SAM in 2008

### Christophe Churet

- Master in International Business
- Analyst experience since 2005
- Joined SAM in 2005

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