

Renewable Energy Status, Trends and Investment

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Presentation Overview



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About REN21

- **Founded in the Political Declaration of the International Conference for Renewable Energies, in Bonn, Germany, June 2004.**
- **Convenes international multi-stakeholder leaders** with the aim to enable a rapid global transition to renewable energy.
- **REN21's Mission** → To Promote policies for worldwide renewable energy expansion through
 - objective policy guidance (**POLICY**)
 - high quality information (**ADVOCACY**), and
 - exchange between relevant actors (**EXCHANGE**)



About REN21: Key Functions and Outp18/10/10uts

• Facilitating Policy Processes

- Supports the **International Renewable Energy Conference Series (IREC)**, including the upcoming **Delhi International Renewable Energy Conference (DIREC)**, from October 27 – 29.
- Coordinates the **International Action Programme (IAC)**, encouraging voluntary actions towards the advancement of renewable energy globally.



• Transfer of Knowledge and Information

- Releases regional reports, policy publications, and the flagship **Global Status Report (GSR)**. REN21 recently released the **Renewables 2010 Global Status Report** - www.ren21.net/globalstatusreport
- Provides information services, such as the **Renewables Interactive Map**, and interactive and comprehensive source of information on renewable energy development and policy - www.ren21.net/map



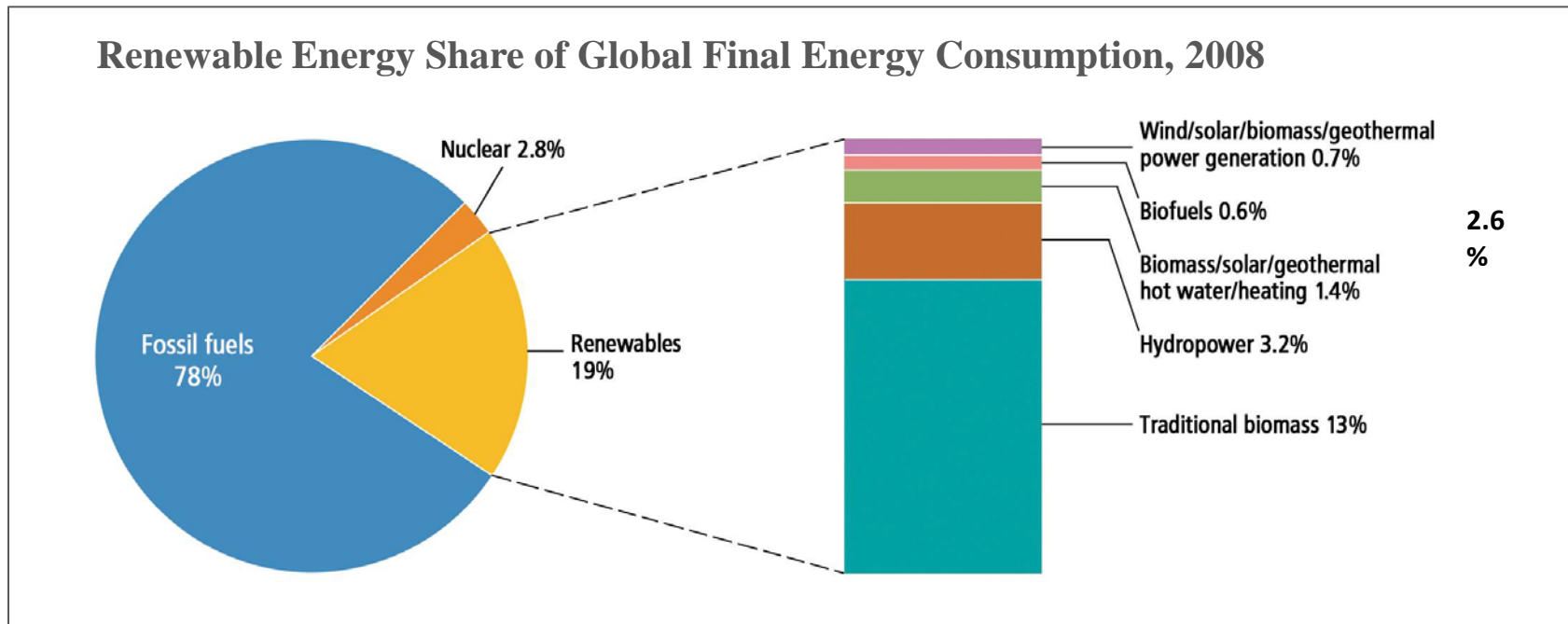
• Interaction and Exchange

- REN21 works in conjunction with a variety of international organisations and stakeholders, such as Reegle, sharing experiences, and advancing best practise.



Market Overview 1

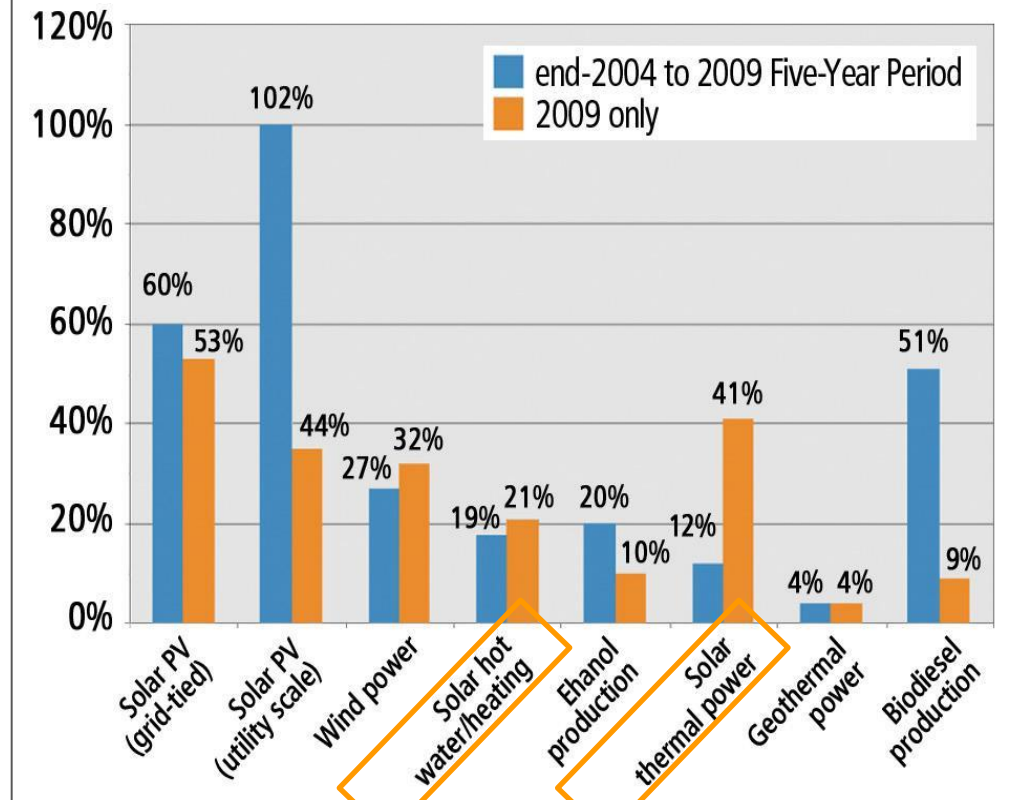
- **Renewable energy supplied 19% of global final energy consumption** (incl. large hydro (3,2%), tradit. biomass (13%), and other “new RE” (2,6%), also **solar hot water/heating**)
- **RE replace conventional fuels in four distinct markets** => power generation, transport fuels, rural (off-grid) energy supply, and **hot water and space heating**



Market Overview 2

- **Global RE capacity growth rates of 10-60% per year (from 04-2009)**
- **In 2009, more wind capacity added than other RE**
- **Solar PV increased fastest (60% in 5 years)**
- ***Solar hot water/ heating* growing at rates of 3-6% (comparable to rates for fossil fuels, 3-5%)**
- ***Solar thermal power* show strong growth rate of 41%**

Average Annual Growth Rates of Renewable Energy Capacity, end 2004 to 2009



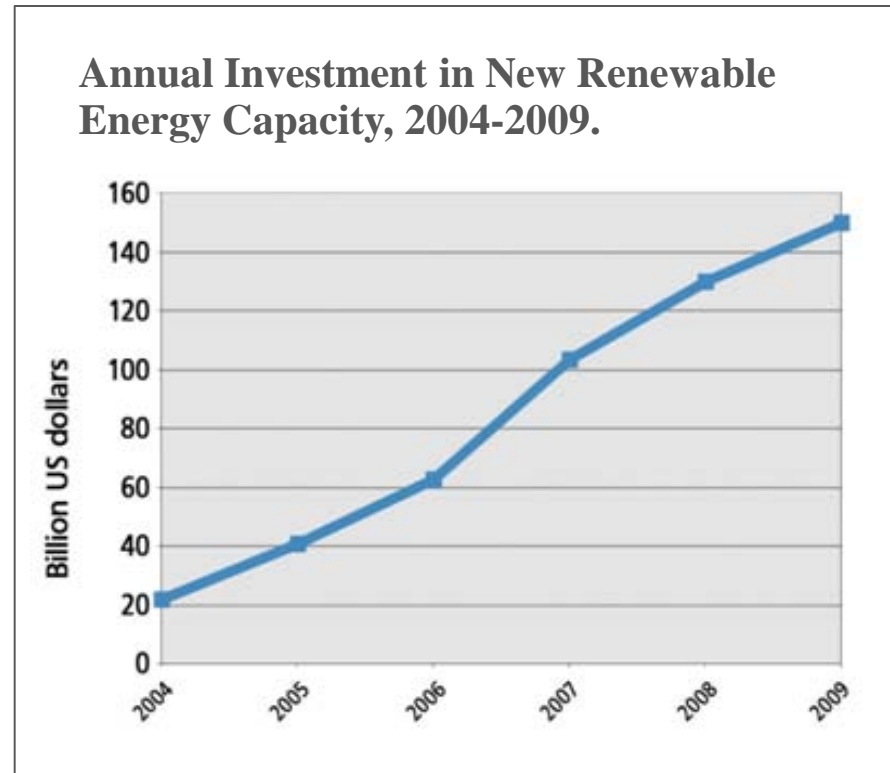
Investment Flows

In 2009 ...

- Investment in RE capacity (excl. large hydro) was **\$150 billion** => \$130 billion in 2008.
- Global investment in **small-scale projects** => **\$50 billion** (e.g. solar hot water)
- Governmental “**green stimulus**” programs for economic recovery of financial crisis 2008 => **\$188 billion** allocated to RE/energy efficiency (mostly still to be spent 2010/2011)

In early 2010 ...

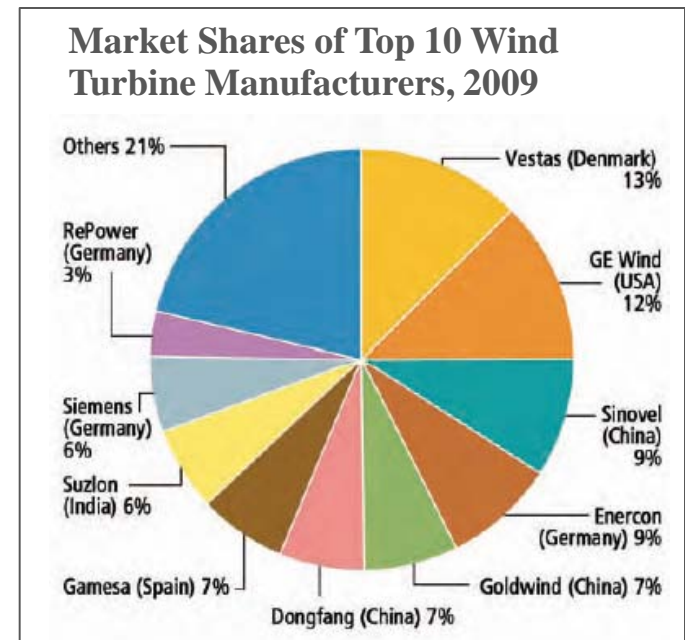
- Investment in clean energy assets (excl. large hydro) was **\$29.5 billion** (\approx 63% more than in same period 2009)



Industry Trends in Renewable Energy 1

Windpower Industry...

- **China** continues its emergence as a **global manufacturer of wind turbines**, with Sinovel, Goldwind and Dongfang now among the world's 10 largest manufacturers.
- In **Europe**, clear targets set by the **EU Directive** (20% final energy share by 2020) are driving **new projects across the region**.
- In the **USA**, national **stimulus funding** provided a boost for new wind projects, following the **decline of the tax equity market**.



Biomass Power and Heat Industries...

- **Strong international interest** in electric power generation by **co-firing with coal and biomass**. Key **challenges** include the **sourcing, transportation, storage and handling of feedstock**.
- **European solid biomass industry grew** by more than 2% from 2007 to 2008, providing **5.6 TWh** of electricity for an **increase of 10.8%** during this period.
- In **China**, 3 million biogas digesters and 400MW of biomass for power generation installed in 2009.

Industry Trends in Renewable Energy 2

Solar PV Industry...

- **2009** saw **major declines in PV module prices** from highs averaging **\$3.50** to lows of **\$2.00** or less. This price decline drove a purchasing lag as buyers waited for further reductions.
- **Thin film PV** maintained a **25% market share**. Of roughly 150 thin-film manufacturers in existence in 2008, only **about half (70) remained in 2009**.
- Firms in **mainland China and Taiwan** produced **49%** of global solar cells. **Europe** produced **18%**, **Japan 14%**, and the **USA 6%**.

Concentrating Solar Power (CSP) Industry...

- CSP manufacturers and developers **focused on the US and Spanish markets in 2009**.
- CSP was **increasingly valued** as a **hedge against carbon pricing**, and as a **source of peaking, intermediate, and baseload** generating capacity (paired with thermal storage or natural gas generating capacity).
- **No single leading CSP technology has emerged**. **Parabolic troughs** employed in 50% of planned installations, **power towers** in 30%, and **dish/engines** in 20%.



Industry Trends in Renewable Energy 3

Ocean Energy Industry...

- **Wave and tidal energy** has benefitted from **government grants** and **private investment**, notably in the UK, Ireland, Portugal, Denmark, France, Australia, South Korea, Canada and the USA.
- The **UK and Ireland** are the largest markets for Ocean Energy, with twenty firms developing marine energy technologies in these regions.



www.pelamiswave.com

Hydropower Industry...

- The years 2007 – 2010 overall represented **unprecedented levels** of business in the hydropower sector. Pre-orders for 2011 and beyond are high – average **orders for the 2010s** expected to **exceed those of the 2000s**.
- In **mature hydropower markets** (EU, USA, Canada and Japan), the focus is on **relicensing** and **repowering** existing installations, and **adding hydro capacity** to existing dams.
- In **developing countries** (China, Brazil, Ethiopia, India, Malaysia, Turkey, Vietnam) developers are focusing on **new hydro-construction** – with extensive development in China.

Solar Hot Water and Heating Industry...

- **China** remains **leader** of global solar hot water industry & manufacturing covering **77% of global solar hot water/heating capacity**.
- **European** solar hot water/heating industry is 2nd, with **solid annual growth of 12%**.
- **Trend** towards larger “**combi**” systems for **water & space heating**.
- **US firms** report **stronger market** than 5 years ago (esp. California).

Ethanol Industry...

- The ethanol industry faced **numerous challenges** in 2009, including **unfavourable market conditions**, increased interest in **second-generation bio-fuels**, **fluctuations in ethanol prices**, and inability to raise **new financing from debt and credit markets**.
- **Brazilian ethanol industry** was **hit hard** by the **credit crunch**. The **Brazilian National Development Bank** covered funding breaches, while two ethanol producers **filed for bankruptcy protection**.
- **Outlook improved by the end of 2009**. Boosted in the USA by **lower corn prices** and **higher oil prices**, and in **Brazil** by the government’s aim to **double national production by 2017**.

Biodiesel Industry...

- **Europe** remains the world's **top biodiesel producer**, as home to over **280 production facilities** with an **annual production** of nearly **24 billion litres**, mostly in **Germany**.
- **European biodiesel industry** continued to **stagnate** in 2009, with **low levels of capacity utilization**.
- **US biodiesel industry** suffered under **EU imposed regulations** limiting the flow of American biodiesel imports to Europe (historically the leading destination for US production).

Second Generation Biofuels Industry...

- Second generation biofuels **not yet produced commercially**. Substantial government support, notably in the EU, USA, Canada, China, Brazil, India and Thailand.
- **US Department of Energy** granted up to **\$564 million in stimulus grants** for pilot plants and commercial-scale projects.
- **Challenges remain** in developing **infrastructure**, reaching commercial **scale**, ensuring feedstock **supply**, lowering enzyme **costs**.



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Thank You



Further Information:

www.ren21.net

www.ren21.net/globalstatusreport/g2010.asp

www.map.ren21.net



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