

Climate Change, trade and production of  
energy-supply goods:  
The need for levelling the playing field  
*Veena Jha*

Presentation at the WTO workshop on  
environmental goods and services. This  
presentation is based on a paper prepared for  
the ICTSD, 23-25 September 2009

# Background

- The economic crisis implies that expenditures on climate change mitigation and adaptation must also make economic sense.
- The mood on trade is also increasingly protectionist.
- Relatively large “green” fiscal stimulus packages have been announced and are being implemented.
- However, will these fiscal stimulus packages tilt the renewable-energy playing field in favour of countries which give large packages?
- How are developing countries placed in this game?
- In the WTO context, are the EGS negotiations may provide an opportunity for balancing trade and environment interests.

# In theory:

- Renewable energy products liberalisation => expansion of markets for climate friendly technologies and services=>incentive for innovation.
- Diffusion of and access to renewable energy goods =>Puts economy on low-carbon trajectory.
- But the important issue is will reduction of tariff and non-tariff barriers actually increase trade in renewables and the deployment of renewable energy technologies?
- Another problem that arises is whether the HS classification can adequately capture renewable energy technologies and products at the 6-digit level.

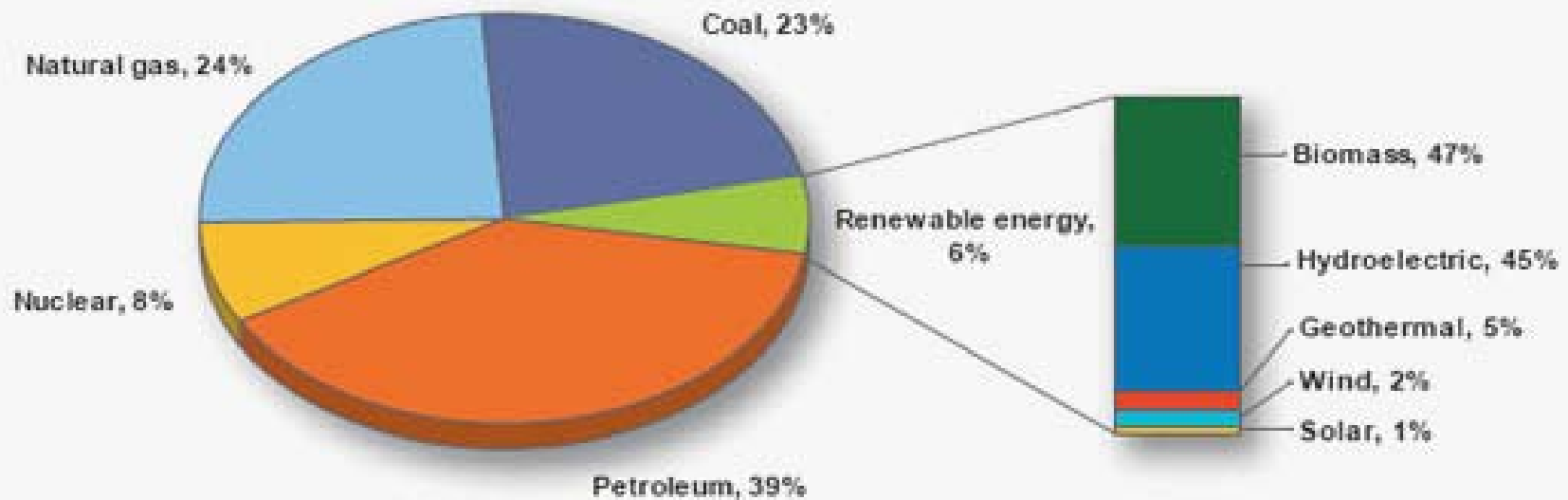
# Methodology used

- Products identified based on ICTSD mapping study:
  - Sub-categories that are directly used for RE supply (“single end-use” products): bio-ethanol, biodiesel, solar water heaters, PV modules and wind turbines
  - Components that may be used in RE supply (but in general also have other applications)
- Trends of trade, tariffs and production analysed.
- Market drivers on the basis of a regression analysis.
- Implications for trade negotiations on the basis of policy variables identified.

# Limitations

- Six-digit tariff lines generally too broad (84 HS items).
  - Single environmental end-use products involves “ex-item” issues. Only one product – wind turbines (HS 8501.32) – fully single use. In other cases, 6-digit HS codes include unrelated products.
  - Components involve multiple-use issues. In general requires expert opinions and industry surveys.
- Trade statistics examined and corroborated with US 10-digit and EC 8-digit codes to examine these issues, wherever possible
  - Does not really resolve issues, but increases transparency
- Products with large non-environmental use excluded (e.g. gas turbines that are mostly used in airplanes).
- From this, products which are mostly single environmental use isolated. Only 5 to 7 products.

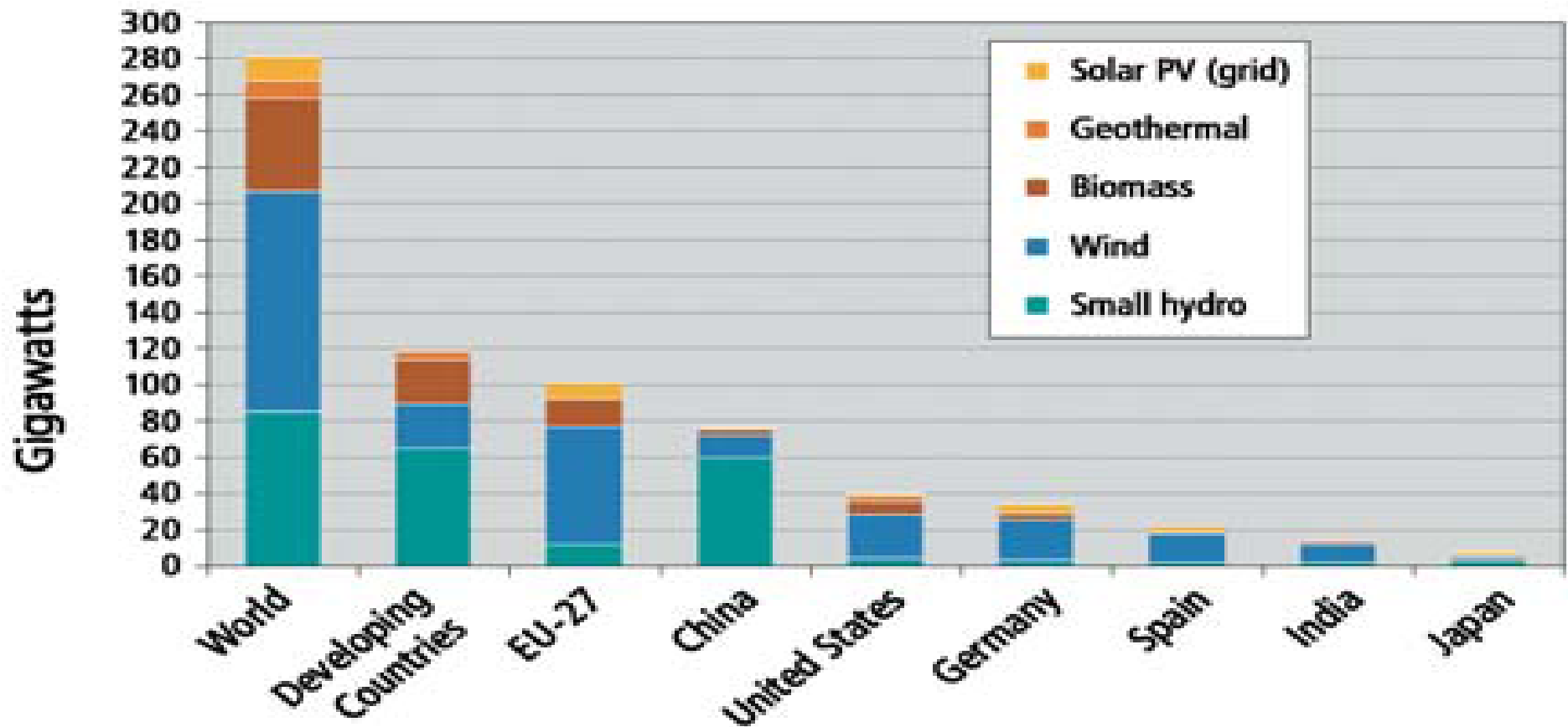
# Renewable energy goods, a growing market with new players



Source: EIA, 2004a & b

Figure 2: Summary of biomass resource consumption

**Figure 4.**  
**Renewable Power Capacities, Developing World, EU and Top Six Countries, 2008**



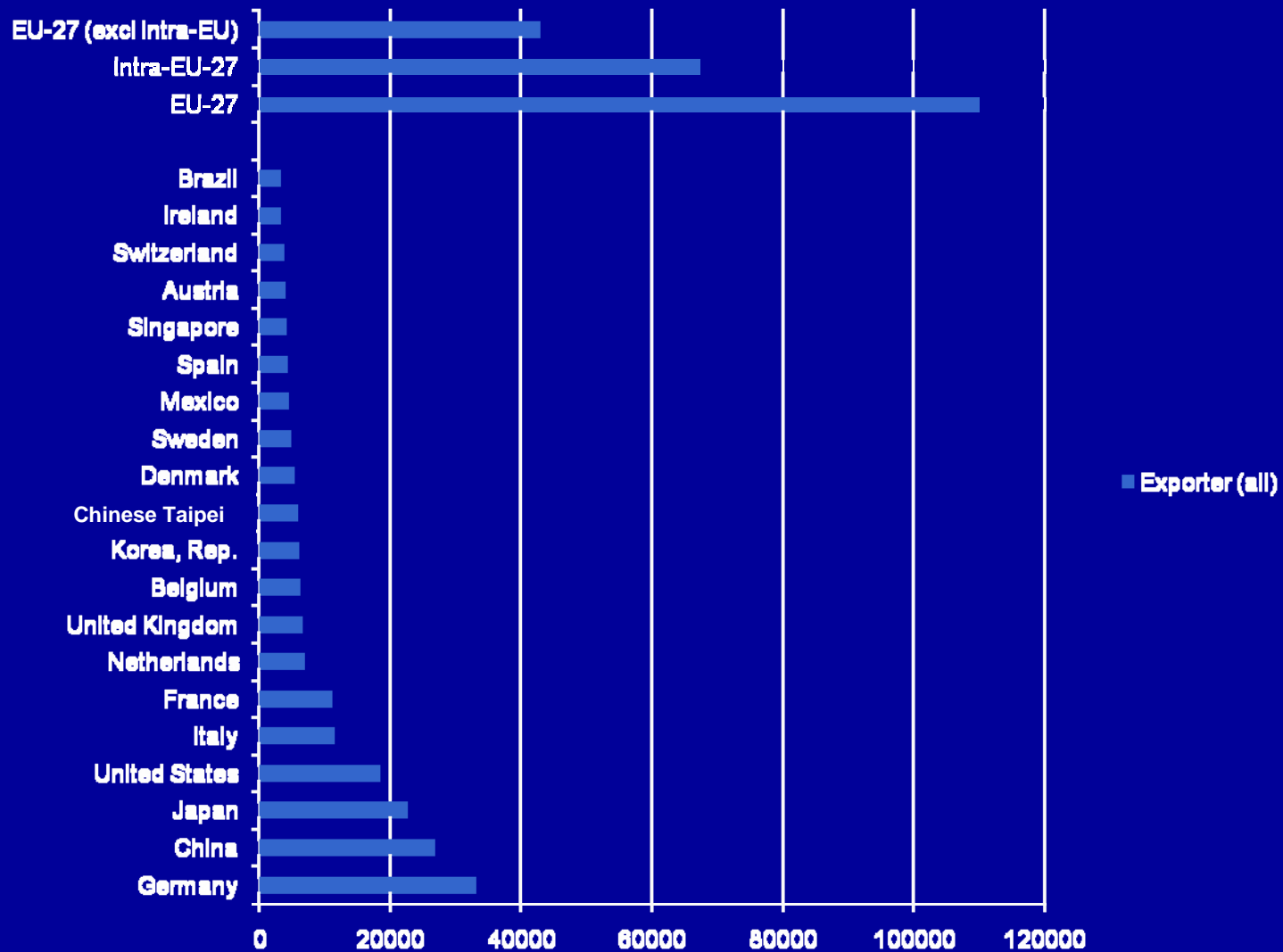
*Note: Excludes large hydropower*

# Who are the major players?

- 18 of the top twenty RE firms are from developed countries, with a majority from Europe.
- The industry largely developed by power utilities.
- The Spanish utility Iberdrola and FPL Energy, a subsidiary of the U.S. utility FPL Group, were leading generators of renewable energy in 2007.
- Exports of **RE technologies and components** is largely dominated by the European players as they have benefitted from incentives.
- In the next five years the US and China are likely to emerge as big players following their large green stimulus packages.



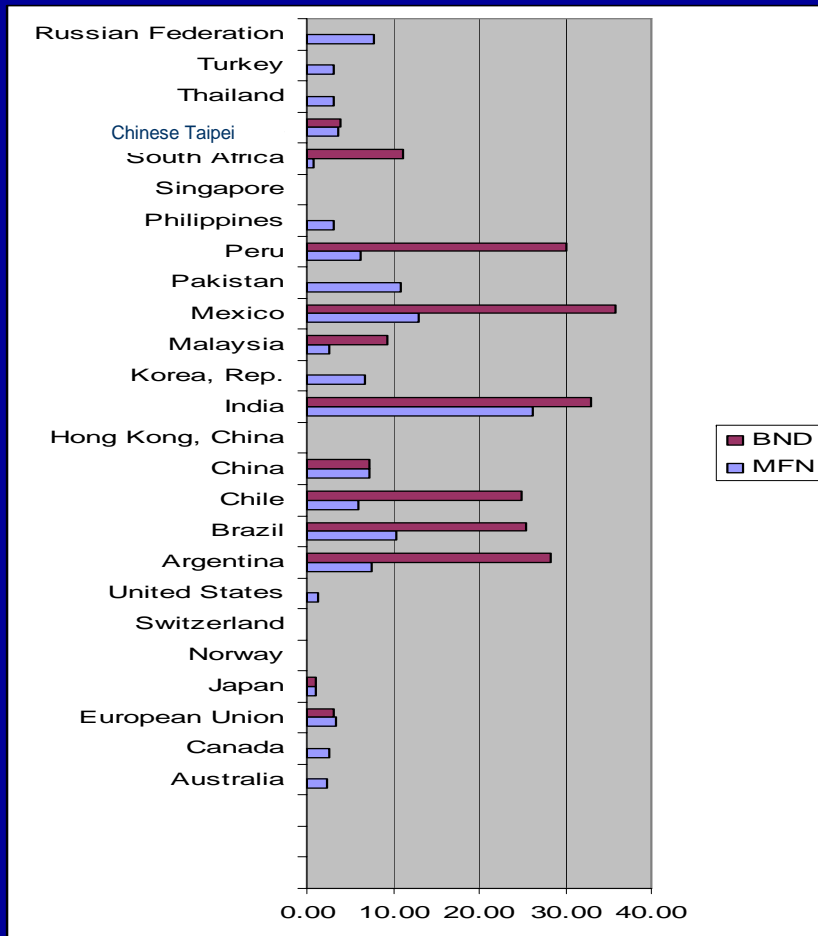
## Top twenty Exporters of all renewable energy equipment and components in 2008



# Emerging players

- China a major exporter in almost all forms of renewable energy sources, especially in solar energy.
- Other developing country exporters: Chinese Taipei, Brazil, Malaysia, Korea, Singapore, Mexico, India, Thailand, South Africa, Argentina, Viet Nam, Pakistan, El Salvador, Turkey.
- But, as a whole, the developing countries are not important traders.
- Major exporters also exporters of industrial products.

# Tariffs on RE supply products



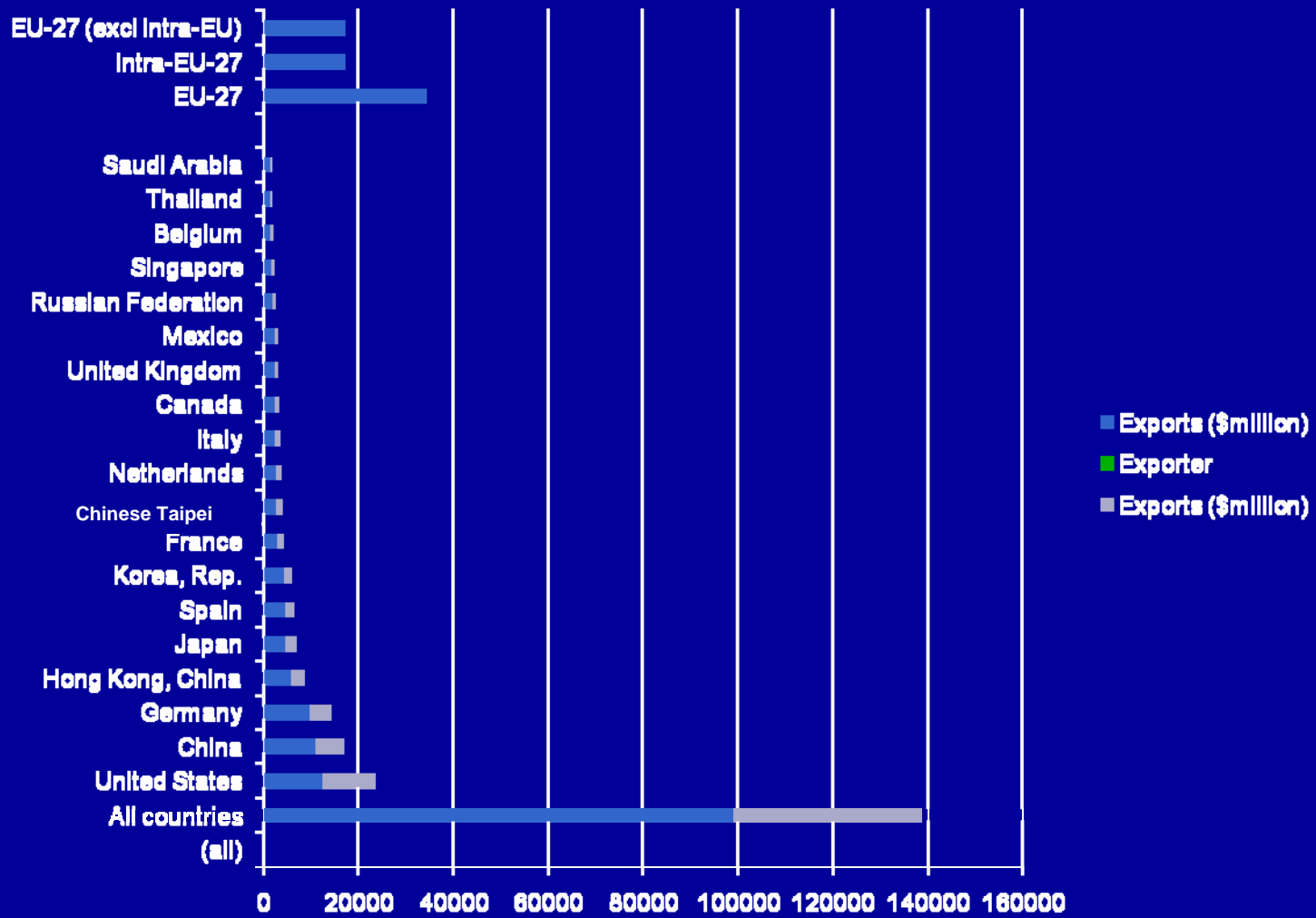
- Tariffs in the top trading nations are generally below 10%.
- In fact, apart from India the GRULAC countries have the highest bound tariffs (but this is not specific to the RE supply sector, these countries have high bound rates in general)
- Tariffs for 854140, which has large trade weight, are bound at zero in most developing countries!!

## Developing country **exports** of selected RE products, 2007

- HS 854140 (PV panels): \$10807m (60.0%)
- HS 382490 (Bio-diesel): \$3842m (21.3%)
- HS 2207 (Bio-fuels): \$2357m (13.1%)
- HS 850231 (Wind turbines): \$525m (2.9%)
- HS 841919 (Solar water heaters): \$397m (2.2%)
- HS 732290 (Solar air heaters): \$130m (0.7%)
- All selected products \$18009m (100.0%)

## Developing country **imports** of selected RE products, 2007

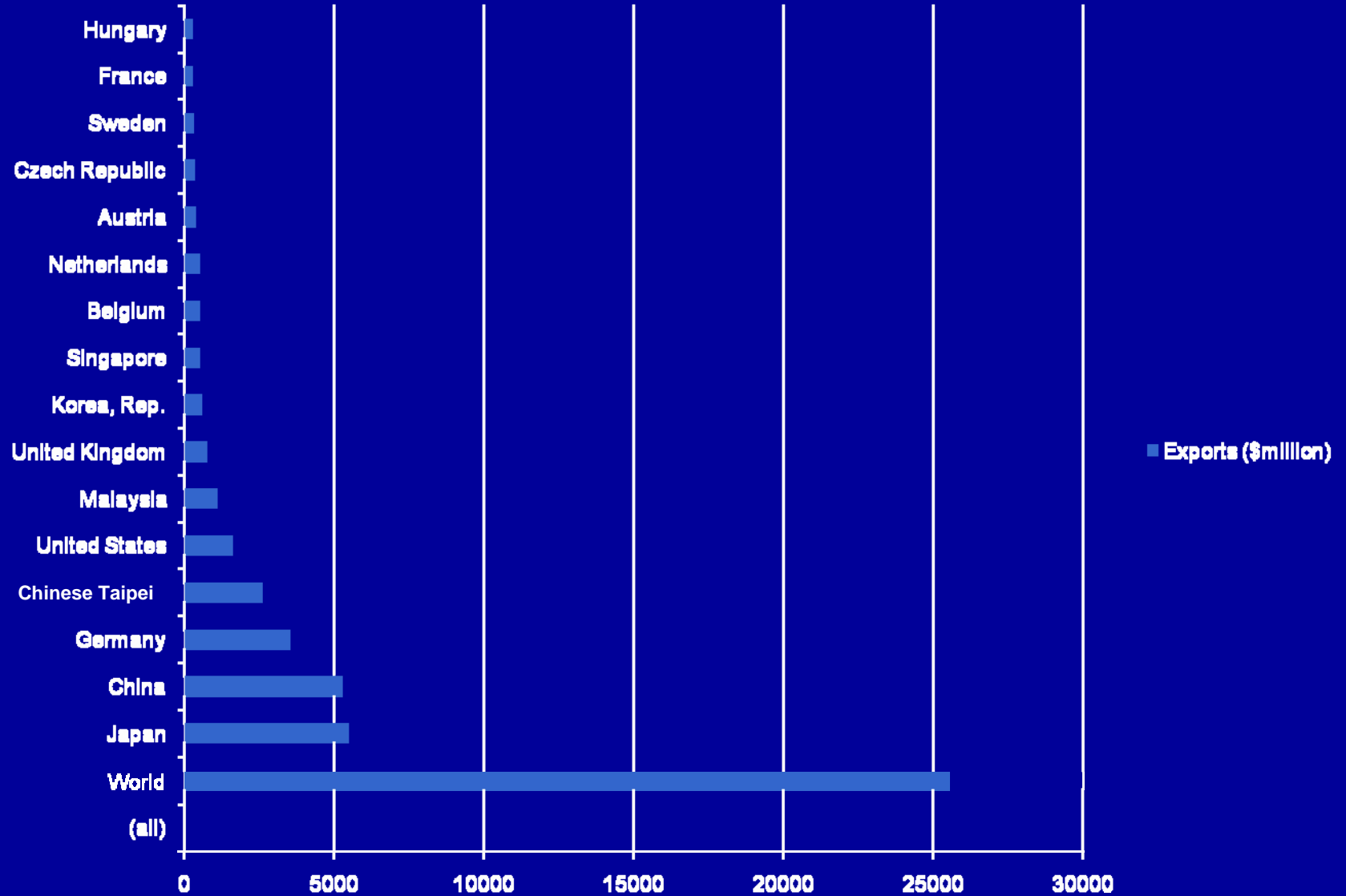
- HS 382490 (Bio-diesel): \$11412m (51.1%)
  - **Attention: These are largely unrelated chemical products**
- HS 854140 (PV panels): \$6968m (40.1%)
- HS 2207 (Bio-fuels): \$983m (4.4%)
- HS 850231 (Wind turbines): \$753m (3.4%)
- HS 841919 (Solar water heaters): \$219m (1.0%)
- HS 732290 (Solar air heaters): \$69m (0.7%)
- All selected products \$ 22349m (100.0%)



# Analysis of exports of solar

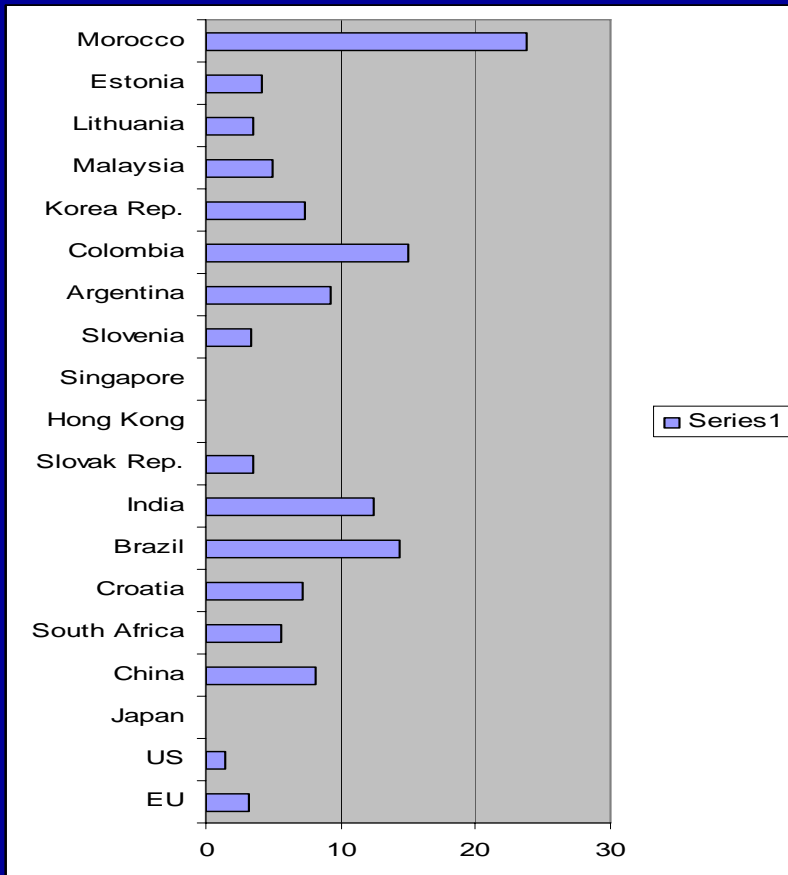
- The global photovoltaic (PV) industry faces an oversupply situation leading to falling prices along the supply chain by at least 20-40% in 2009.
- Further, the global PV market in 2009 is likely to decrease by around 10% in value terms over 2008. (SolarPlaza, Nov 2008)
- China is emerging as the largest player in PV with a substantial share of global trade as well. China's high share in trade in PV is also indicative of the fact that several components of solar technology have now become tradable.

## Exports in 2007 of HS 854140 including PV(\$million)





# Tariffs on solar technology products



- The applied tariffs are in generally below 15%.
- Major importers have low or zero tariffs.
- Only Morocco which is not a major trader has high tariffs.
- When prices are falling, tariffs unlikely to be an important market driver.

**Table 10: Top twenty exporters of wind-energy technologies and components in 2007**

<b>Exporter (all countries)</b>	<b>Exports (\$million)</b>	<b>Exporter (developing countries)</b>	<b>Exports (\$million)</b>
All countries	87759	Developing countries	21981
Germany	34681	China	6764
Japan	28132	Mexico	2886
Germany	13370	Singapore	2105
China	6854	Korea, Rep.	2088
United States	6852	Brazil	1391
Italy	6764	India	1236
France	6220	Turkey	1106
Denmark	5850	Chinese Taipei	983
Italy	4683	Malaysia	680
France	3793	Thailand	634
Mexico	3709	Vietnam	482
Spain	3006	South Africa	363
United Kingdom	2886	Tunisia	180
Belgium	2662	Saudi Arabia	150
Singapore	2550	Colombia	145
Korea, Rep.	2301	Argentina	127
Denmark	2105	Morocco	109
Austria	2088	Kazakhstan	105
Sweden	1858	Syrian Arab Republic	96
Belgium	1854	Chile	55
EU-27	48106		
EU-27 (excl intra-EU)	19974		18
Intra-EU	28132		

# Top ten exporters of wind powered turbines

European Union	1,902,068.667
Denmark	1,718,601.575
Germany	969,479.000
Japan	354,009.471
India	335,817.506
Spain	197,977.299
China	78,019.421
Italy	44,382.913
Australia	36,859.894
Netherlands	15,758.659

# Analysis of wind energy exports

- A third of the world's wind capacity is now under the aegis of the top 20 wind farm owners.
- Two Chinese manufacturers (Goldwind & Sinovel) and one from India (Suzlon) in total now represent 18 % of the global supply.
- Apart from wind turbines, the top twenty exporters of components of wind energy supply goods are however not exactly the same as the top twenty producers of wind energy.
- However, the top producers may also be top importers except recently when localisation requirements may have been introduced.
- Large producers such as India may also be producing for the local market, but where assembly is in third countries they may be importing components.
- Tariffs in this case is also at about the same levels as solar energy.

# Summing up trends in trade and deployment of renewable energy

- Only a handful of **key** players in this industry
- Trade in components, **e.g. in wind energy** is important.
- In single use products, esp in biofuels, wind components and solar photovoltaics, developing countries more important than in larger lists.
- China, Mexico and Brazil are important traders no matter which list we look at.
- Important to note that ranking of countries does not change much with changes in composition of lists.

# Market drivers

- The provision of **incentives** in the form of feed-in tariffs for renewable energy generation is an important market driver for RE equipments and components as is the availability of finance and investment.
- Feed in tariffs are often operationalised through equipment procurement certified suppliers and local content requirements. This is especially true of the recently enacted fiscal stimulus packages-
- Tariff reduction may make trade easier, **but tariff reduction alone** is unlikely to be sufficient to generate markets.
- Patents may also be major market drivers.

# Contd

- Setting targets for renewables and providing an enabling environment for meeting these targets could be another important driver for trade.
- Lack of feed-in tariffs or subsidies discourages large companies from making investments in developing countries.
- Feed-in tariffs may however have little to do with biodiesel and solar water heating. Developing countries have a large share in these products.
- Decline in venture capital necessitates financial commitments from global funds.

# Testing correlations between market drivers and trade

- The higher the share of renewables in the grid the higher would be exports of RE technologies and products.
- Government support and feed-in tariffs would increase exports of RE technologies and products.
- The number of patents registered in a country is also likely to increase exports.
- High tariffs are likely to decrease trade especially imports. However in most cases the correlation with tariffs is extremely weak.



# Determinants of markets

- Turning to imports, patents and share of renewables as well as feed-in tariffs affect imports of renewables as well as components of wind and solar energy.
- This analysis points to the fact that tariff reduction by itself may not generate trade in renewables. Other support policies, targets and standards may be more important in determining trade flows.

# Role of Patents

- Studies suggest that patents may not be a barrier to the dissemination of renewable technologies.
- Registering patents increases exports, perhaps showing specialisation.
- Over two thirds of the patents in developing countries are owned by non-residents.
- The fact that non-residents such as multinationals feel the need to register patents prior to exports from developing countries suggests that the technologies may be copiable or it may be embedded in the parts that they are exporting.

# Policy Implications and proposals

- Only a handful of players important in trade in renewables. Any negotiating proposal for liberalising trade will need to take account of this.
- No matter how careful the mapping exercise, translating renewables to six-digit tariff lines has serious limitations. In most cases it would include **unrelated products and/or** multiple-use products.
- **Emerging economies** and **developing countries** important players, though their share of trade is less than half that of developed countries.

# Policy Implications and proposals

- Markets in developed countries have grown exponentially during the last few years in response to the subsidies provided for renewable energy consumption and the huge volume of venture capital investment. **China seems to have benefitted from this.**
- Given the grip of the economic and the financial crisis it is unlikely that such venture capital will come to developing countries.
- It is also likely that subsidies or incentives to the green economy in the developed countries will increase through the stimulus packages.
- Countries which have little capacity to provide subsidies would need some assistance through international mechanisms to develop a renewable energy industry.

***Thank you very much***

***Please send comments to  
veenajha09@gmail.com***