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The Indian Wind Energy Market

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Global Wind Energy Council

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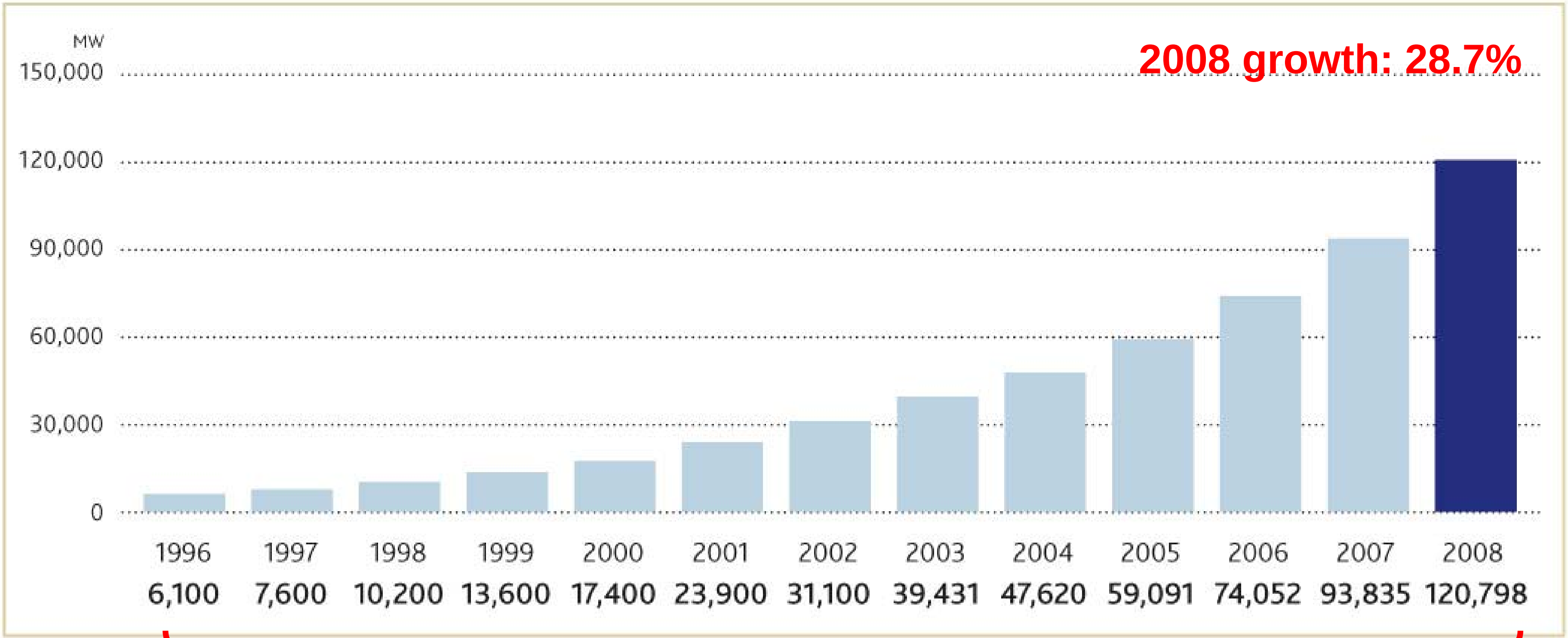
Cumulative Installed Capacity

GLOBAL CUMULATIVE INSTALLED CAPACITY 1996-2008



12 yr avg growth: 28.3%

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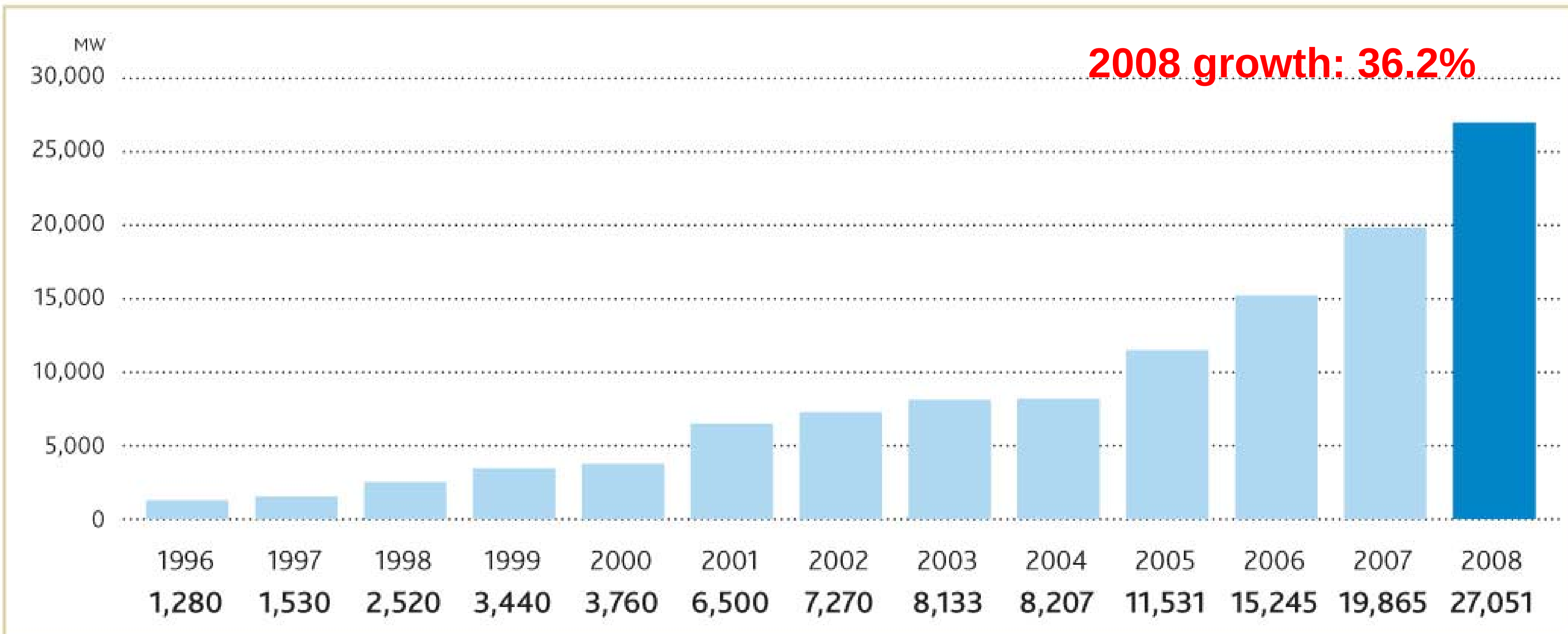
Annual Installed Capacity

GLOBAL ANNUAL INSTALLED CAPACITY 1996-2008



12 yr avg growth: 30.6%

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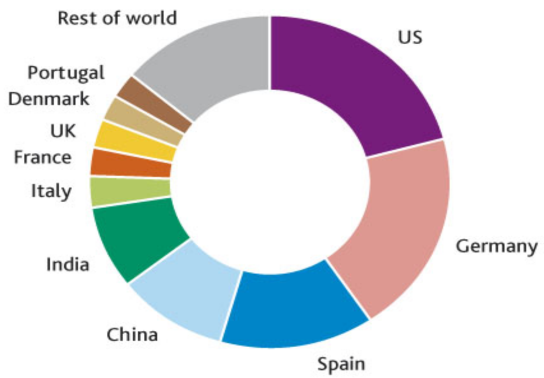
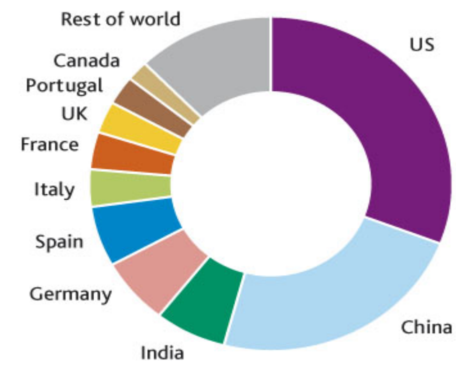
2008 Market Leaders

TOP 10 TOTAL INSTALLED CAPACITY 2008



	MW	%
USA	25,170	20.8
Germany	23,903	19.8
Spain	16,754	13.9
China	12,210	10.1
India	9,645	8.0
Italy	3,736	3.1
France	3,404	2.8
UK	3,241	2.7
Denmark	3,180	2.6
Portugal	2,862	2.4
Rest of world	16,693	13.8
Total top 10	**104,104**	**86.2**
World total	**120,798**	**100.0**

TOP 10 NEW CAPACITY 2008



	MW	%
USA	8,358	30.9
China	6,300	23.3
India	1,800	6.7
Germany	1,665	6.2
Spain	1,609	5.9
Italy	1,010	3.7
France	950	3.5
UK	836	3.1
Portugal	712	2.6
Canada	526	1.9
Rest of world	3,285	12.2
Total top 10	**23,766**	**87.8**
World total	**27,051**	**100.0**

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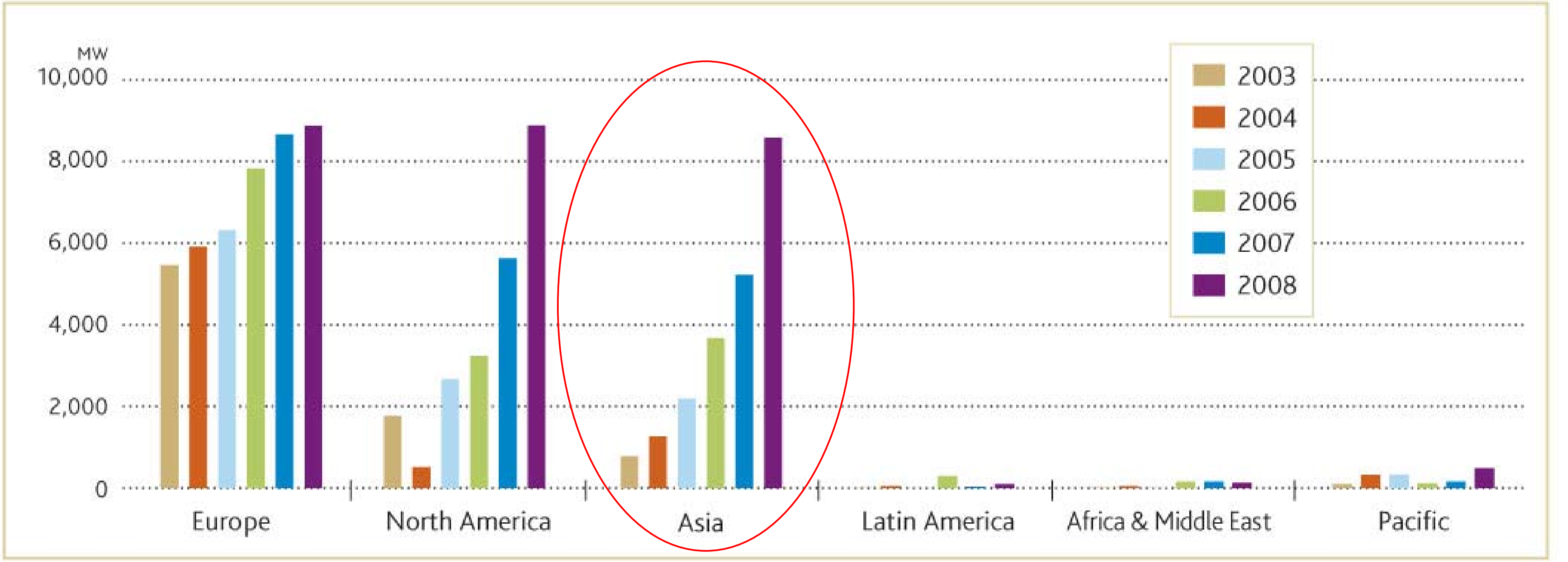
Regional Breakdown

ANNUAL INSTALLED CAPACITY BY REGION 2003-2008



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Summary Status

- Three main markets: Europe, US and China – each with a strong political commitment

- China now home to largest manufacturing industry – likely to be #1 market in 2009, and #1 overall early in the next decade

- European market continues to broaden – new boom expected with offshore

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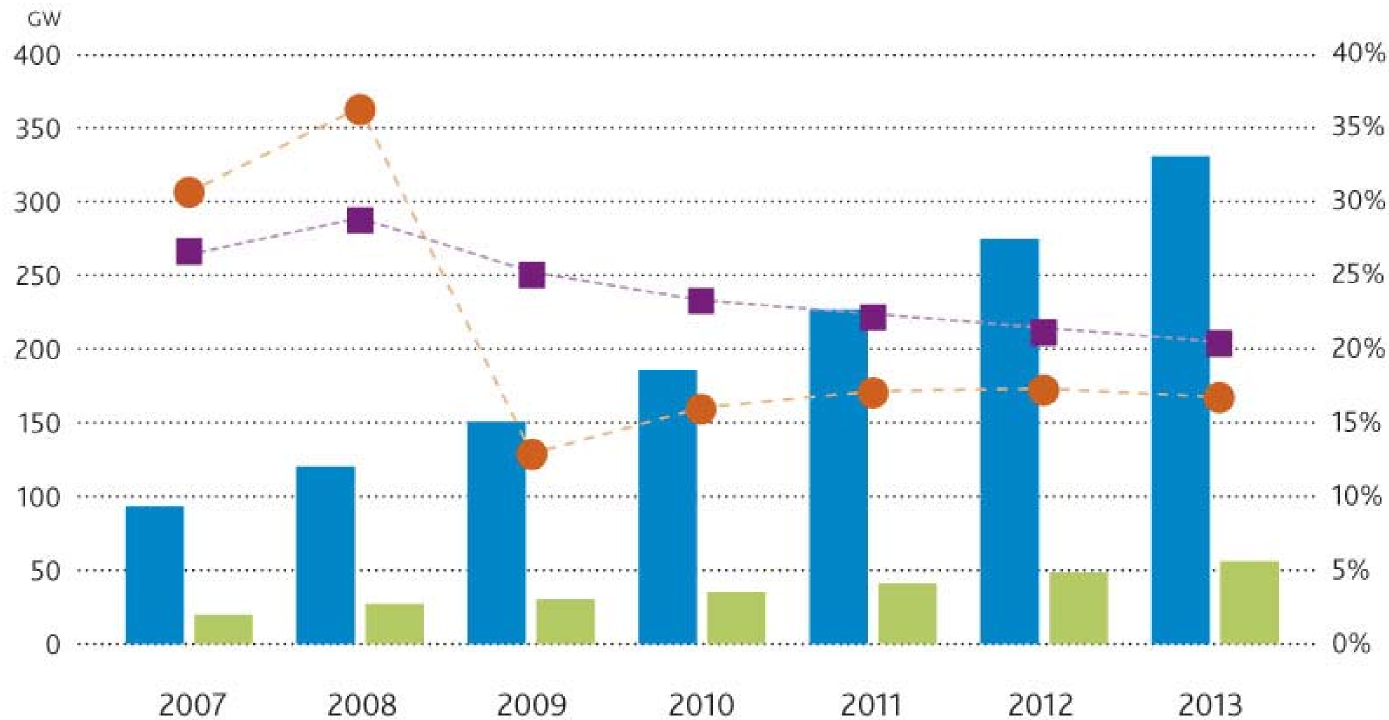
Projections to 2013

MARKET FORECAST 2009-2013



	2007	2008	2009	2010	2011	2012	2013
Annual installed capacity (GW)	19.9	27.1	30.4	35.2	41.2	48.2	56.3
Cumulative installed capacity (GW)	93.8	120.8	151.2	186.4	227.6	275.8	332.1
Annual install capacity growth rate	30.7%	36.2%	12.5%	15.7%	17.0%	17.0%	16.8%
Cumulative capacity growth rate	26.7%	28.7%	25.2%	23.3%	22.1%	21.2%	20.4%

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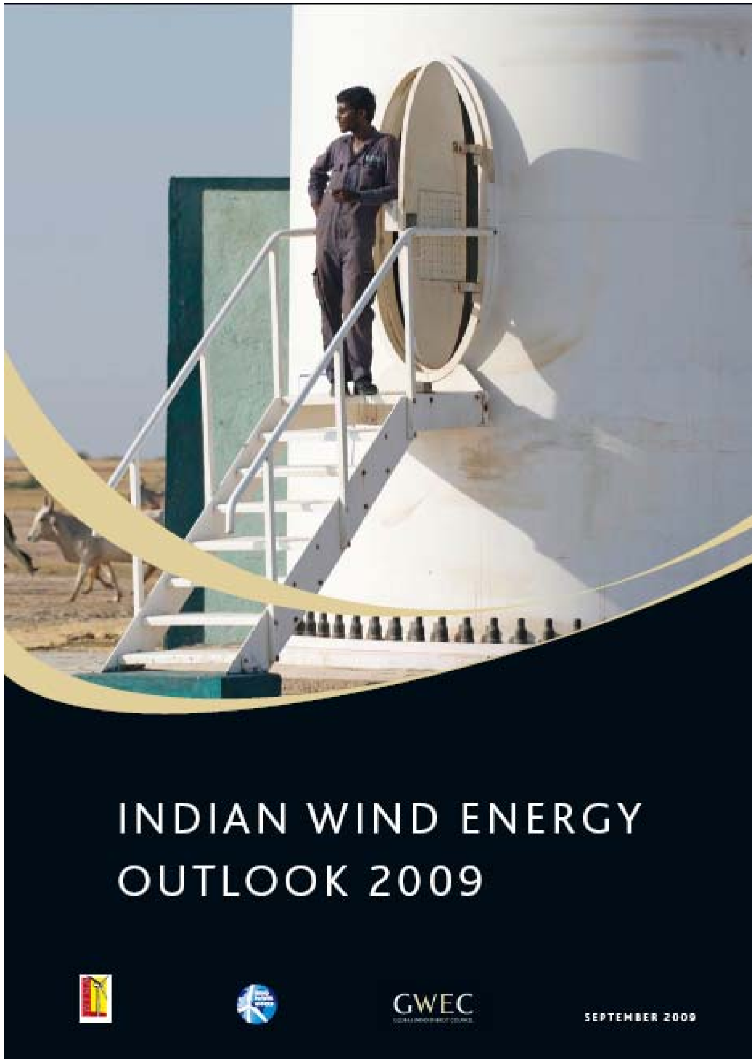
Indian Wind Energy Outlook 2009



September 2009

Cooperation between GWEC and IWMTA

Launched by Hon. Minister Dr. Abdullah Farooq, MNRE

Content:
- Status of Indian wind market
- Scenarios up to 2020
- Policy recommendations

To be found on www.gwec.net

Indian Wind Energy Market – Policy drivers

Targets

- 2008-2012 (10th Five Year Plan): Target of adding 14 GW of RE (10.5 GW wind) – up from 13.2 GW
- RE to contribute 4-5% of India's electricity mix by 2012

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Indian Wind Energy Market – Policy drivers

National policies for wind

- 2003 Electricity Act: restructuring of electricity sector, introduction of SERCs
- SERCs to set Renewable Portfolio Standards (RPS)
- Fiscal and financial incentives (concession on import duty, 80% accelerated depreciation, 10 year income tax holiday etc)
- Land policies to enable wind development
- Financial assistance (IREDA): soft loans to RE projects
- Wind resource assessment (C-WET)
- National feed-in tariff to be introduced in October 2009 for up to 4,000 MW: 0.5 rupees/KWh (= 0.007 euro cents)

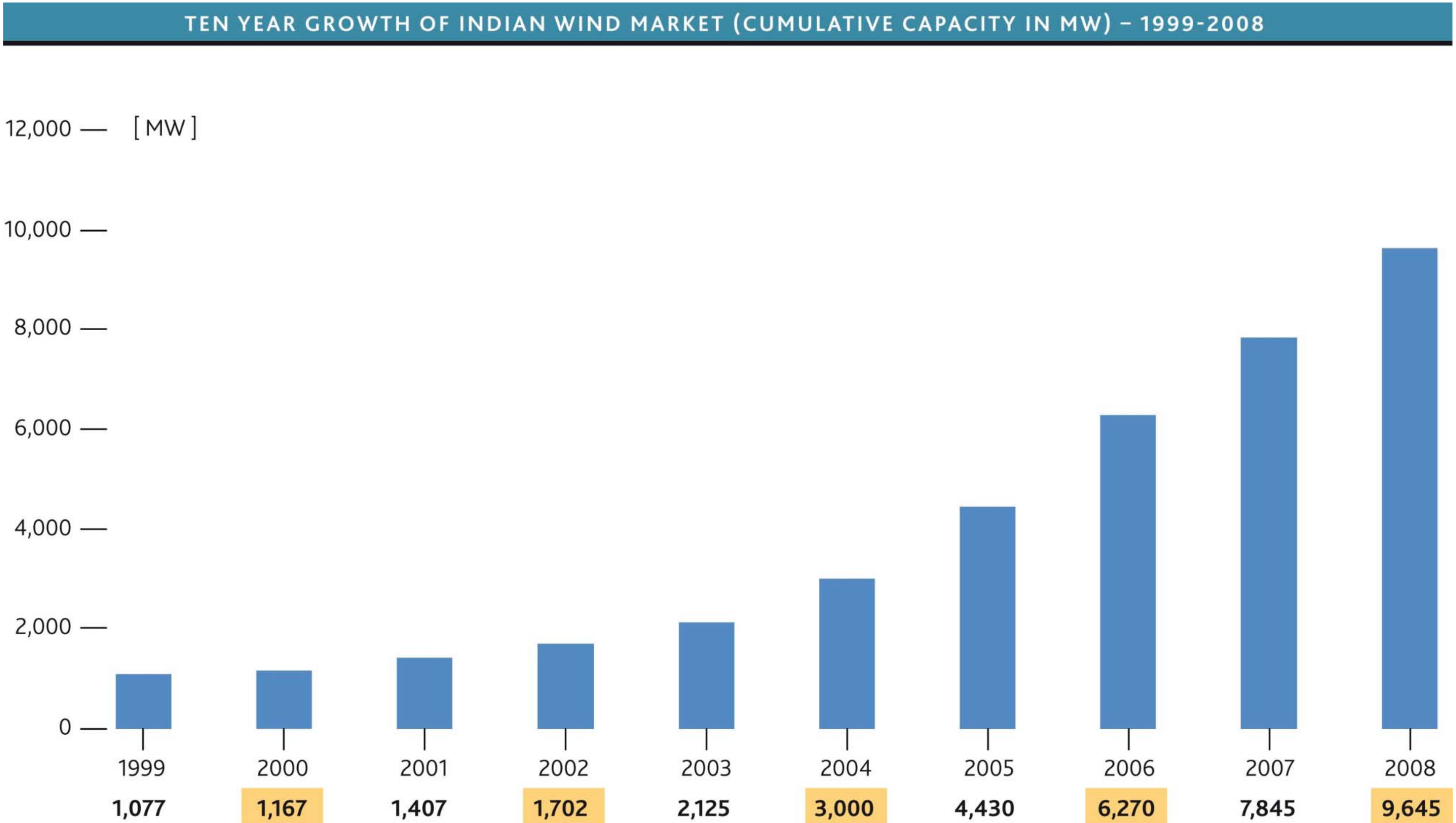
Indian Wind Energy Market – Policy drivers

State policies – main drivers

- Special tariffs for wind power in 9 states (mostly around 3.5-4.5 Rs/kWh = 0.5-0.65 euro cents)

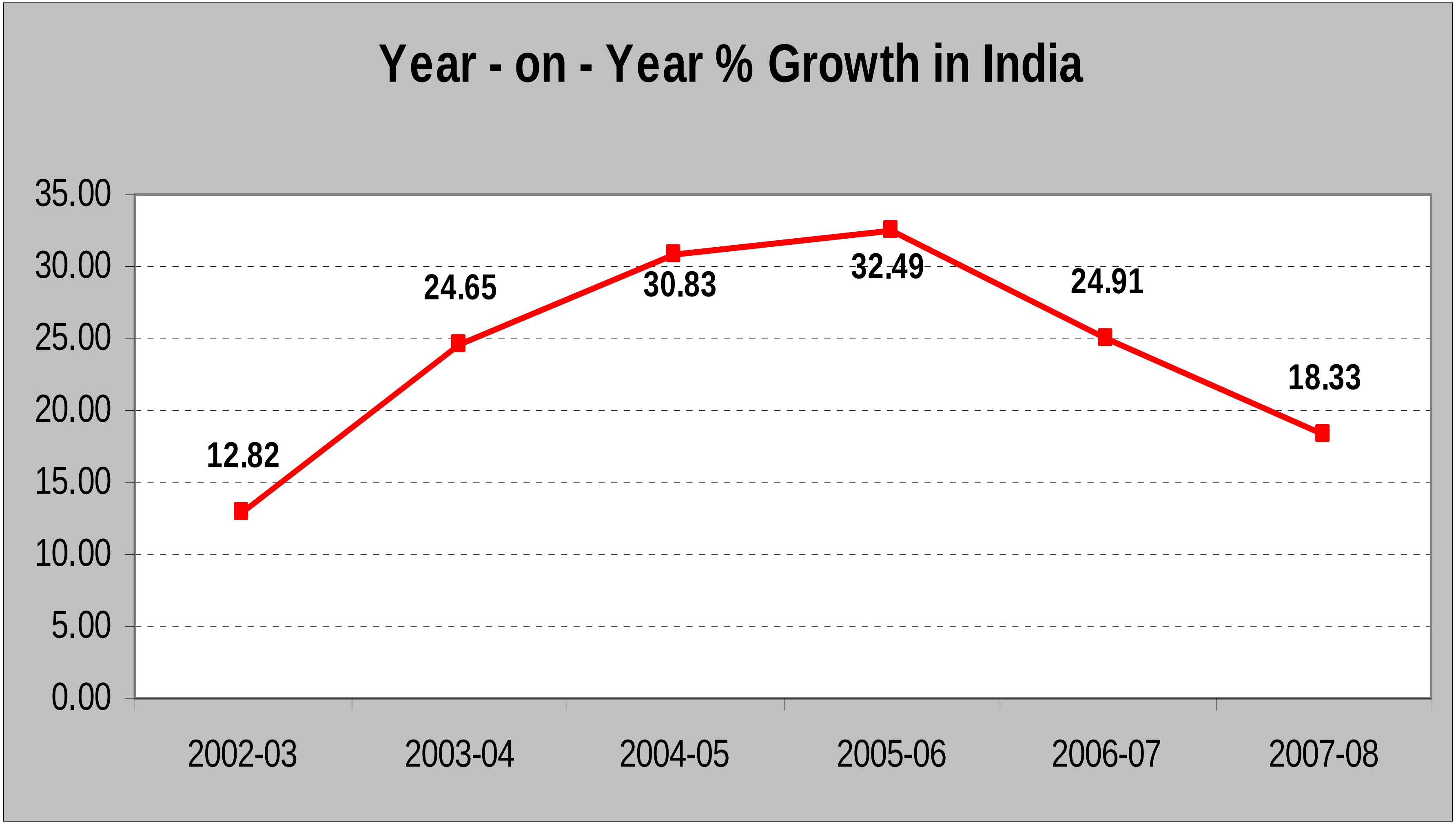
- Renewable Portfolio Standards in 10 states, ranging from 2% to 10% for 2008/2009

Indian Wind Energy Market - Status



Source: IWTMA

Indian Wind Energy Market - Status



India Scenarios

- **Global scenario history**: 1999 - 2009

- **Part of a larger effort:** “Energy [R]evolution” scenario, which has now become a reference for both the IEA and now IRENA

- **Three scenarios:**

  Reference: IEA World Energy Outlook 2007

  Moderate: Existing policies and policies likely to be enacted; continuing development of carbon markets

  Advanced: Full policy and political support

Scenarios: Capacity and Production

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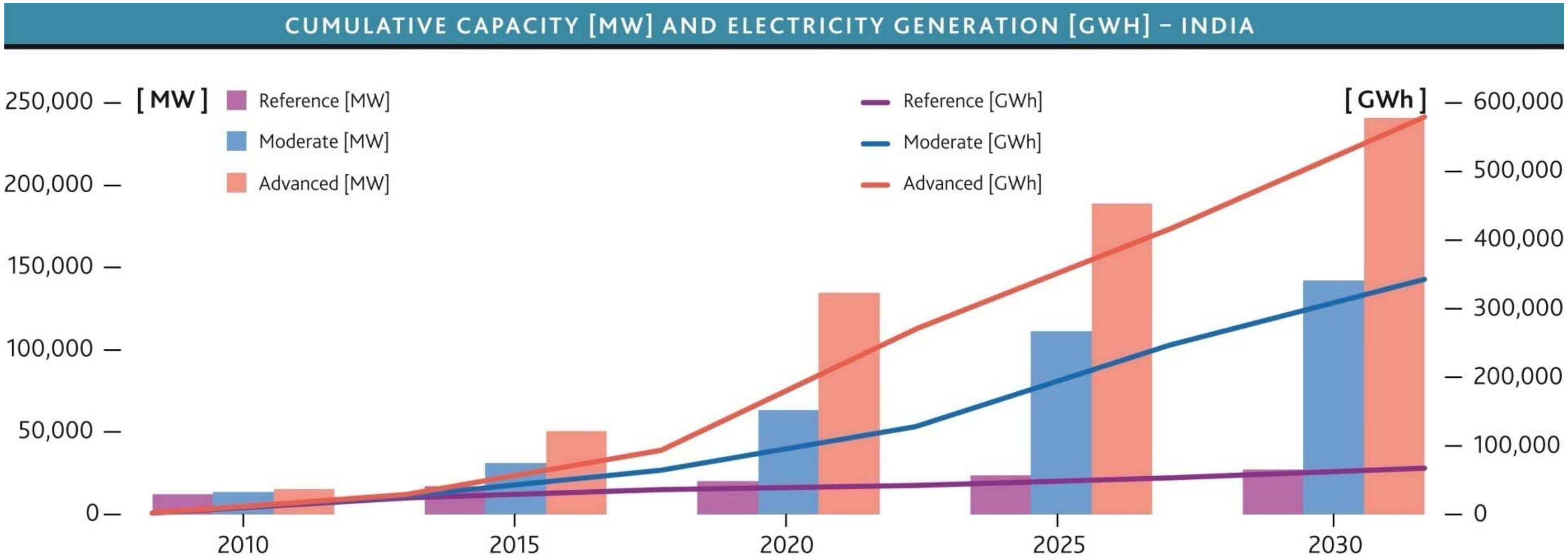

CUMULATIVE CAPACITY [MW] AND ELECTRICITY GENERATION [GWH] INDIA

Year		2010	2015	2020	2025	2030
Reference	[MW]	12,495	17,119	20,332	23,571	27,325
	[GWh]	22,491	34,238	40,665	51,856	65,580
Moderate	[MW]	13,741	31,436	63,230	111,432	142,219
	[GWh]	24,734	62,873	126,459	245,151	341,325
Advanced	[MW]	15,070	45,991	134,828	189,104	241,349
	[GWh]	27,127	91,982	269,656	416,028	579,238

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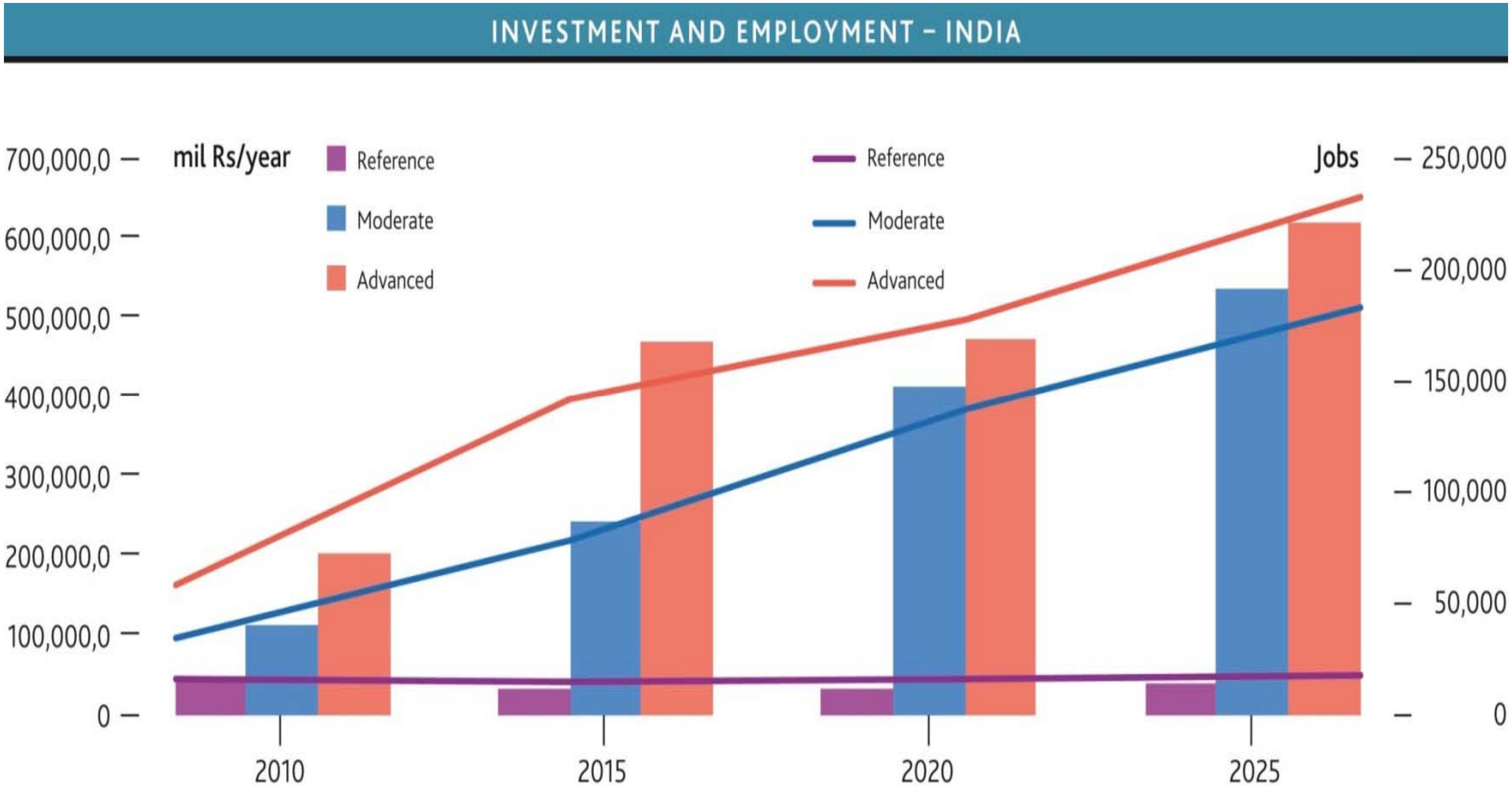
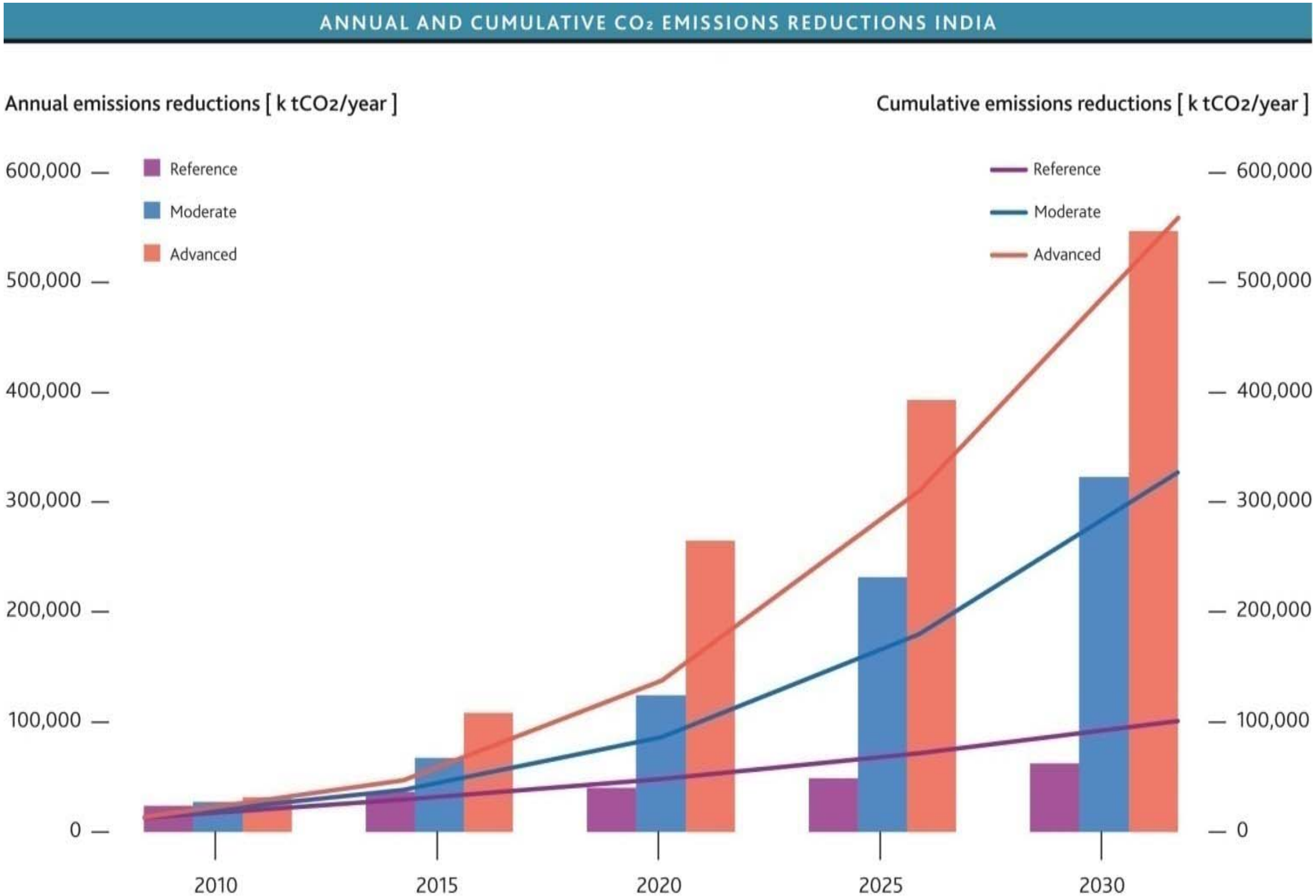
Investment and Employment



CO_2 Emissions Reductions



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India scenarios summary

SUMMARY OF WIND ENERGY OUTLOOK SCENARIO FOR 2020 – INDIA

Global Scenario	Cumulative wind power capacity [MW]	Electricity output [GWh]	Share of electricity demand	Annual installed capacity [MW]	Investment [mil Rs]	Jobs	Annual CO_2 savings [k tCO_2]
Reference	20,332	40,665	2.6-2.8%	610	30,498	15,317	40,025
Moderate	63,230	126,459	8.1-8.7%	8,247	412,367	136,539	124,470
Advanced	134,828	269,656	17.3-18.6%	9,438	471,899	177,074	265,415

SUMMARY OF WIND ENERGY OUTLOOK SCENARIO FOR 2030 – INDIA

Global Scenario	Cumulative wind power capacity [MW]	Electricity output [GWh]	Share of electricity demand	Annual installed capacity [MW]	Investment [mil Rs]	Jobs	Annual CO_2 savings [k tCO_2]
Reference	27,325	65,580	2.4-2.7%	820	40,987	19,765	62,050
Moderate	142,219	341,325	12.6-14.2%	6,772	338,616	142,219	322,953
Advanced	241,349	579,238	21.4-24.2%	9,500	475,000	213,450	548,061

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Carbon Markets

…from ~zero to € 92 billion (125 bn USD) in four years

TABLE 2: WIND CDM PROJECTS (AS OF 1 AUGUST 2009)

Country	Projects	MW
India	301	5,659
China	371	20,695
Mexico	12	1,272
Brazil	10	674
South Korea	12	339
Cyprus	4	207
Egypt	4	406
Chile	4	111
Morocco	3	92
Dominican Republic	2	165
Costa Rica	2	69
Nicaragua	2	60
Phillipines	1	33
Panama	1	81
Mongolia	1	50
Jamaica	1	21
Colombia	1	20
Israel	1	12
Argentina	1	11
Vietnam	1	30
Uruguay	1	50
Sri lanka	1	10
Cape Verde	1	28
Ecuador	1	2
Total	**739**	**30,095**

Source: http://www.cdmpipeline.org/cdm-projects-type.htm

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How can this be achieved? Policy is key

Ambitious national target:

a) meet the target; b) attract investment; c) build an industry;

Price mechanism: careful transition to national generation based incentive with appropriate tariff

Grid development : priority grid access - grid development ;

Administrative procedures: clear, simple and transparent;

Social and Environmental issues: active programme to ensure acceptance and sustainability

Conclusions

Great Potential – *industrial development, investment and employment. India should be a world leader.*

Generation - *dramatic growth in demand*

Manufacturing – *long track record of quality manufacturing*

Policy driven – *policy environment is fundamental*

Thank you

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"WHAT NATURE DELIVERS TO US IS NEVER STALE. BECAUSE WHAT NATURE CREATES HAS ETERNITY IN IT."

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