Can the CDM stimulate renewables investment in South Africa?

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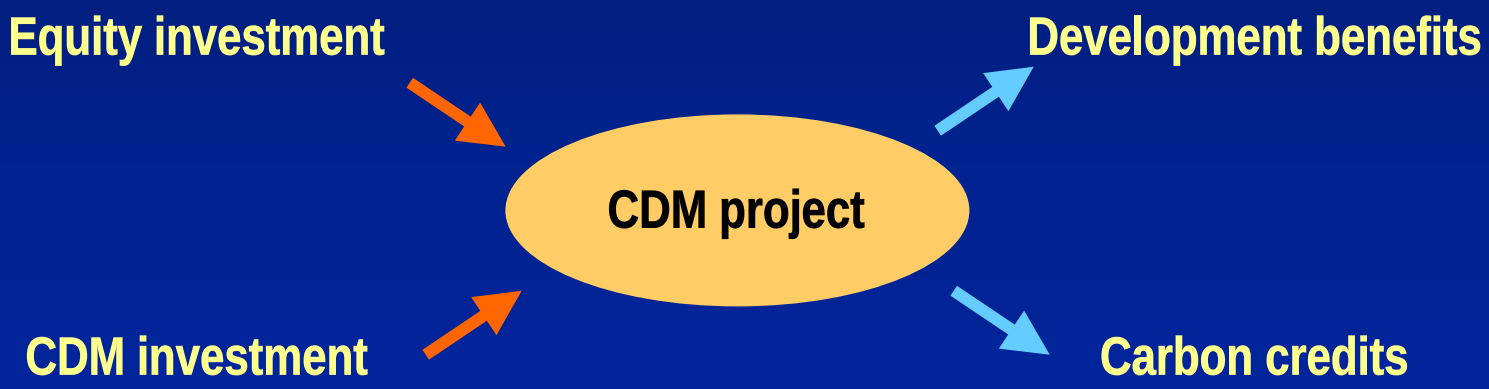
Will the CDM support renewables investment in South Africa?

- Are there feasible renewables projects that reduce greenhouse gas emissions?
- Will these projects qualify for the Clean Development Mechanism (CDM)?
- Will the ‘carbon revenue’ make a significant difference to their financial viability?
  - How many credits are they likely to accrue?
  - Will this revenue significantly impact the project’s viability?

Are there feasible renewable projects in SA?

- In CDM, investor and host would share costs and benefits
- Need to be ‘cost-effective’ -- what does this mean in this context?



Investment opportunities are being identified

- From this project, Integrated Market Assessment for SADC, etc.
- Most policy focus has been on distributed, rural applications (eg solar homes systems), but bulk prices are declining rapidly internationally

Energy prices for renewables are falling rapidly

Technology	Capital cost ($/kW)	Current energy costs (c/kWh)	Potential future cost (c/kWh)
Biomass			
Electricity	900-3000	5-15	4-10
Heat	250-750	1-5	1-5
Ethanol		8-25	6-10
Wind	1100-1700	5-13	3-10
Solar PV	5000-10000	25-125	5-25
Hydroelectric			
Large	1000-3500	2-8	2-8
Small	1200-3000	4-10	3-10

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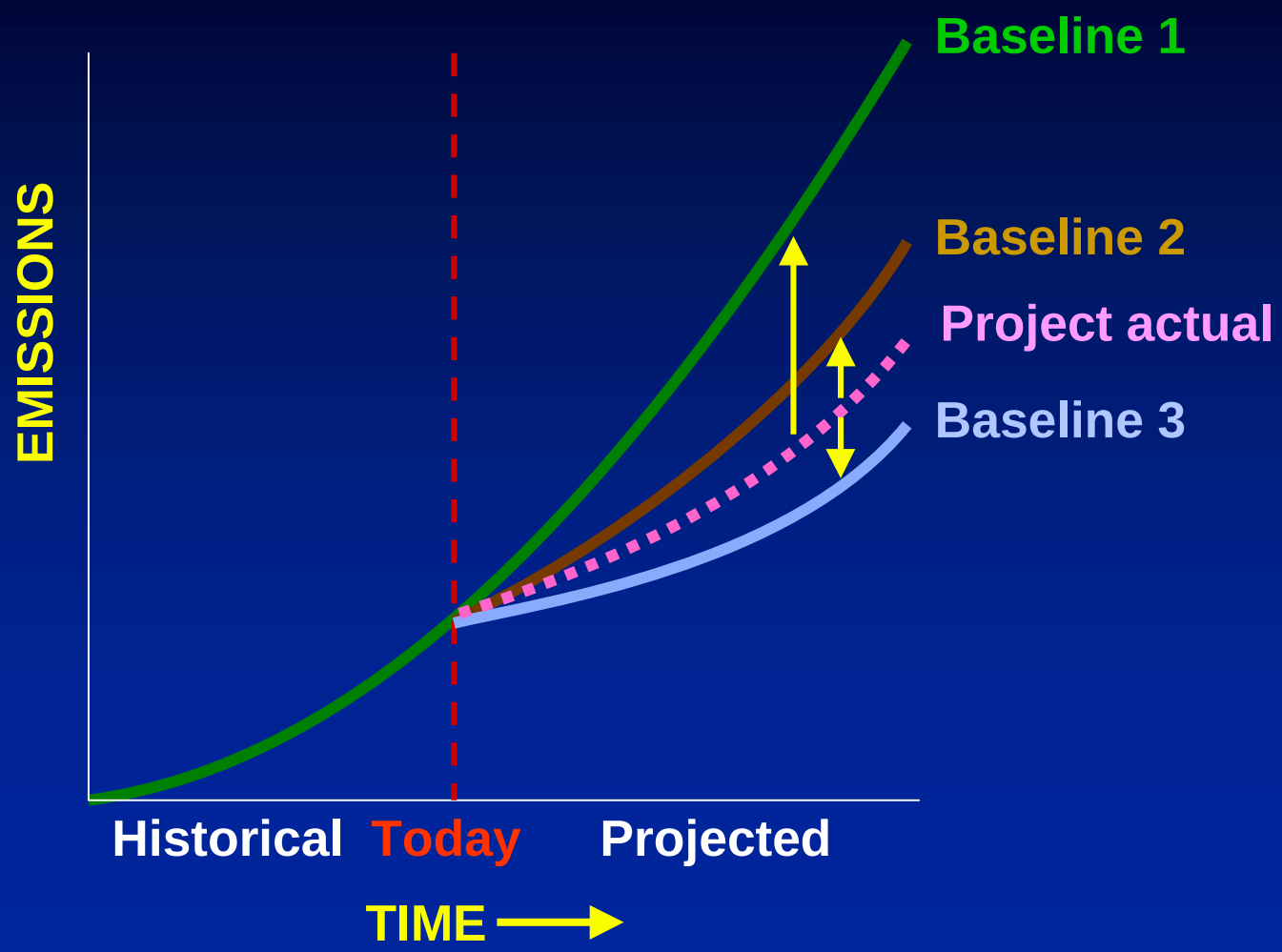
Will renewables projects be eligible for CDM?

- General eligibility
  - CDM may exclude nuclear technologies and sinks
  - Some discussion about ‘fast track’ for RE & EE
  - All projects have to satisfy host country Sustainable Development Criteria
- Not determined in SA yet, but may include:
  - Provision for basic needs of all South Africans
  - Equity
  - Employment creation
  - Economic growth
  - Sustainable use of natural resources

Will projects be considered “additional”?

- Projects that would have happened anyway will not qualify - don’t want to hand out credits (and money) for business as usual projects
- In practice, this is hard to define, but controversial
- Also discussions about investment, environmental, technological and financial additionality
- Different versions of investment additionality proposed
  - IRR (project < reference case or threshold without CERs)
  - NPV with CERs

How many credits will the project receive?



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Different baselines > different amount of CERs

Carbon savings for illustrative bulk electricity projects (kg C/kWh)

Baseline standard	Wind energy Darling:	Off-grid solar home systems	Efficient Lighting Initiative	New gas: Cape Power Project	New coal: Super-critical
Weighted average	0.247	0.247	0.247	0.147	0.031
25th percentile	0.065	0.065	0.065	-0.035	-0.150

Will CERs impact project economics?

- Simple example: Small wind energy project
- Assume data:
  - 5 MW capacity to be installed
  - Capacity factor: 29%
  - Annual generation 12,702 MWh
  - GHG emissions: zero
  - Can sell electricity at 17c/kWh
  - Jobs created: 22 job-years/MW construction; 100-450 people / TWh-year operation
- See www.windpower.dk for Wind Energy Economics Calculator

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Viability: Wind energy example

- Determine the baseline against which CDM project is measured
- Assume baseline for energy sector is standardised at 0.247 kgC/kWh
  - Based on weighted average of coal, gas and imported hydro)
  - Recent plants would give 0.30 kgC/kWh
  - Better-than-average standard might give 0.07kgC/kWh

- Calculate carbon saved
  - 12 702 MWh * 0.25 kgC/kWh = 3 137 tC per year
  - Or about 63 000 tC over 20 years of project

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Viability: Wind energy example

- Assume international price of CERs is $20/tC
  - Estimates range from $5 - $50
- Revenue from CERs: R0.5 million per year
- Normal project costs and benefits:
  - Sales revenue: R 2.16 million per year
  - Capital costs:
    - A) Imported turbine @ $1 000 / kW --> R40m
    - B) Local turbine @ R4 000 / kW --> R20m
    - O&M costs: 1.5% of cap: R0.6 million per year
  - Imports sensitive to exchange rate
  - Local not currently realistic, but local manufacture important

IRR with and without CDM project

Internal rate of return (IRR)	*Without CDM project*	*With CDM project*
Imported turbines @ R 40m	-2%	0%
Local turbines @ R20m	5%	8%

- Other benefits
  - 110 people-years in construction
  - 1-6 jobs in operation and maintenance

Conclusions

- Renewables are likely to be eligible and additional - pass these first hurdles
- Many renewables projects will also meet SA sustainable development criteria
- However, carbon revenue may not be enough to make all renewables viable in the short run - depends on baseline and carbon prices
- Investors will look for projects where CERs make the difference between unacceptable to acceptable returns
  - Need to analyse more real projects and ideas along lines of wind example

Resources

- CDM Capacity Building Project - Minerals and Energy Policy Centre, Energy & Development Research Centre
  - Hesphina@mepc.org.za, randall@energetic.uct.ac.za
- South-South-North Project
  - Steve@southsouthnorth.org
- Others: DBSA


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