Advancing Sustainable Hydropower

Financing the renewable energy transition:

The hydropower perspective

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International Hydropower Association (IHA)

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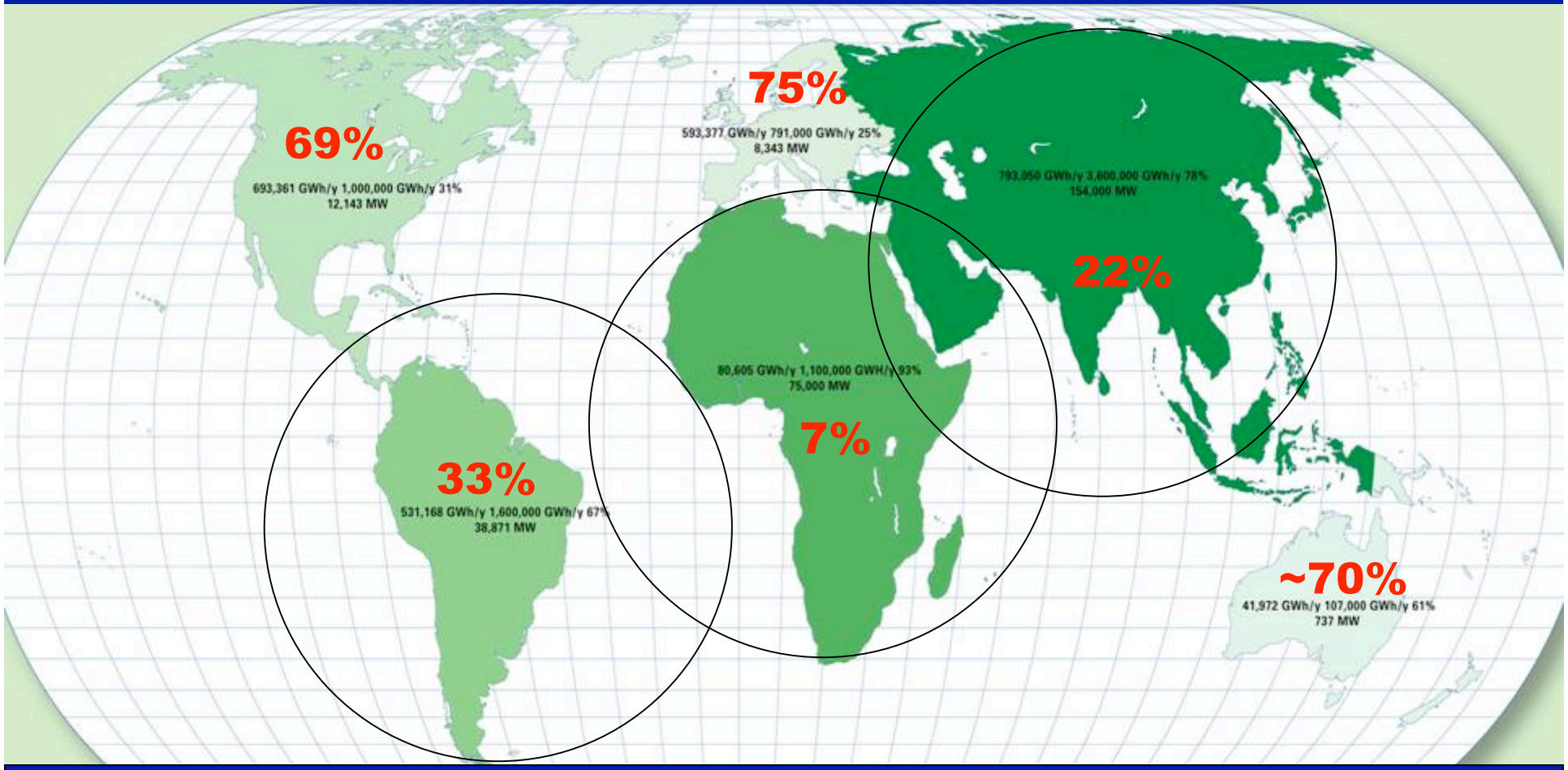
World's realistic potential developed: ~ 1/3

Current hydro production: 2889 TWh/y

Realistic potential production: ~ 8600 TWh/y

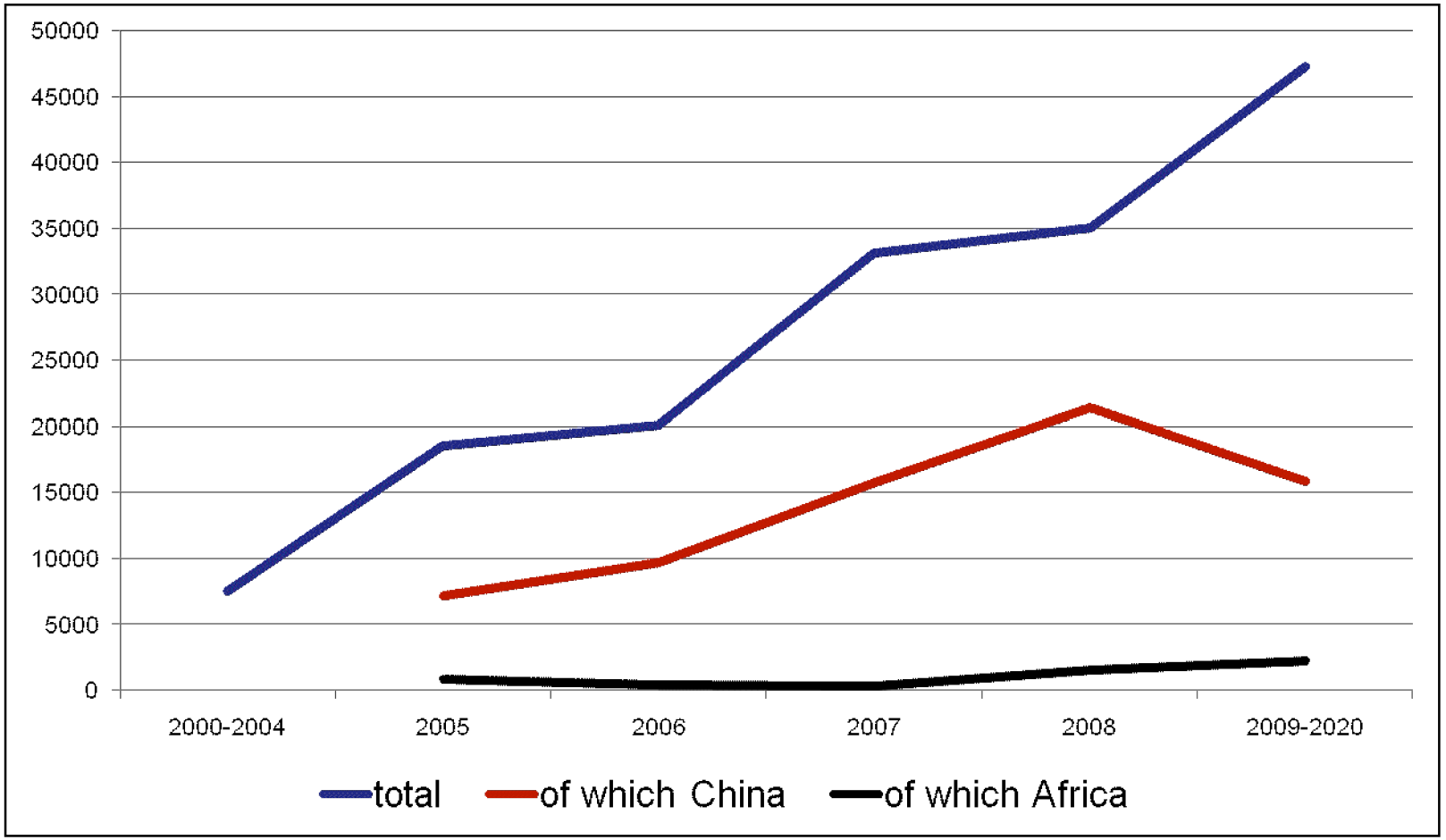


"For non-OECD countries, hydroelectric plants produced 1546 TWh or 21.1% of total gross production reported in 2004. This represents a 9.8% increase over the previous year. Hydro production reported by non-OECD countries has increased at an annual average rate of 4.7% since 1973." – IEA Electricity Information, 2006

Regional potential – regional deployment

Region	Current output (TWh/y)	Part of potential (%)	Total potential (TWh/y)	Realistic contribution (TWh/y)	New-build contribution (TWh/y)
Europe	570	72%	792	633	63
North America	700	69%	1014	812	112
South America	550	35%	1571	1257	707
Africa	80	7%	1143	914	834
Asia	800	22%	3636	2909	2109
Australasia	43	49%	88	70	27
Total	2743	33%	8245	6596	3853
Priorities: Plant-life extension and incremental power / New-build hydro development					

Recent and future deployment trends (MW/a)



Currently under construction: 135GW, of which 85GW in China

WWF Global Energy Scenario Report: 450GW hydropower by 2050

Hydropower investment characteristics

- Costs vary widely depending on site specific conditions

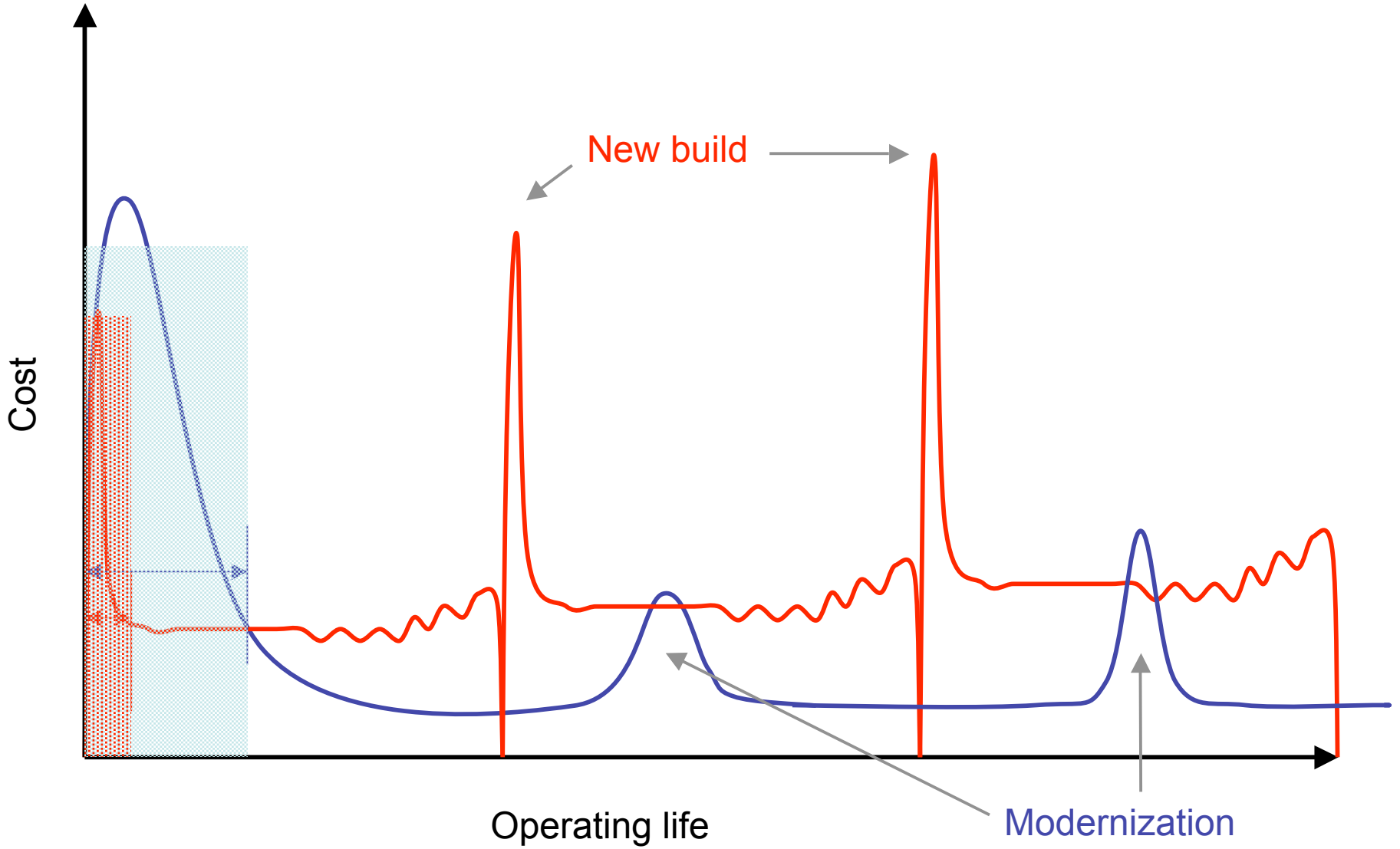
Project size (MW)	Development cost (US$ million/MW)	Operational cost (US$/MWh)
< 10	1 to >5	3 to 10
10 to 100	1 to 2.8	3 to 8
> 100	1 to 1.8	3 to 7

- Based on recent deployment trends and typical investment costs, annual hydro financing currently is circa USD 30 - 40bn / year
- Private financing of hydropower is about USD 4bn / year (Sustainable Finance Ltd)

→ Private sector finance for hydro therefore only 10-15% of total financing, dominance of public funding sources

- High capital intensity, low running costs → front loading of costs: Poor countries and risk-averse private sector unable to invest “on their own”

Financing challenge of hydro vs thermal plants



Additional investment barriers

- Various barriers for hydropower to access carbon markets:
  - Unsatisfactory CDM methodologies
  - Investor country barriers (e.g. EU Linking Directive)
  - Host country barriers (e.g. ownership and equipment sourcing requirements)

- Hydropower is widely recognised as renewable energy, but continues to face sustainability challenges
  - Environmental and social concerns
  - Large versus small debate
  - Sometimes lack of integrated planning approaches
    → insufficient capacity of Governments, River Basin Organisations, other regulators

Recommendations

- Collect and present accurate and comprehensive hydropower markets and investment data
- Continue to develop innovative Public-Private-Partnership arrangements (risk sharing; ownership and operation of different asset components)
- Research GHG status of hydropower and development of improved CDM methodologies based on accurately defined carbon offsets
  → increase access to carbon markets (CDM, CCX)
  → UNESCO-IHA GHG project
- Define widely endorsed standard for hydropower sustainability
  → Hydropower Sustainability Assessment Forum
  → Certification scheme

Thank you for your attention!

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