Estimation on Cost for Mitigation and Adaptation to Climate Change

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Facts on Climate Change in Asia and the Pacific :

1. **AP has been the world's largest resources user since the mid-1990s**. If the current trends continus, its CO2 emissions are likely to more than triple by 2050

2. Energy : **global energy demand is set to increase by 1/3 from 2010 to 2035 with China, India and other developing Asian contries accounting for over 60% of the global total**. Without greater use of RE and improved EE, developing Asia's share in global energy-related CO2 emissions could increase from the current 35% to 45% by 2030

Source : ADB

Previous Studies on Cost for Adaptation

Table 1 Estimates of adaptation costs in developing countries, for 2010-2015

Source	US$ billion p.a.	Comments
World Bank (2006)	9-41	Cost of climate-proofing FDI, GDI and ODA flows
Stern (2006)	4-37	Update, with slight modification of World Bank (2006)
Oxfam (2007)	>50	Based on World Bank, plus extrapolation of costs from NAPAs and NGO projects
UNDP (2007)	86-109	World Bank, plus costing of PRS targets, better disaster response

Source: Agrawala and Fankhauser (2008)

Note: FDI = foreign direct investment, GDI = gross domestic investment, ODA = official development assistance, NAPA = National Adaptation Programme of Action, PRS = poverty reduction strategy

Table 2 UNFCCC estimate of additional annual investment need and financial flow needed by 2030 to cover costs of adaptation to climate change (billion dollars per year in present-day values)

Sector	Global cost	Developed countries	Developing countries
Agriculture	14	7	7
Water	11	2	9
Human health	5	Not estimated	5
Coastal zones	11	7	4
Infrastructure	8 – 130	6 – 88	2 – 41
Total	**49 – 171**	**22 – 105**	**27 – 66**

Source: UNFCCC (2007)

Cost of Adaptation

Adaptation	ANNUAL COST Geography Timeframe	Methodology
Stern Review (2006)	$ 1,5 trillion globally	Integrated Assessment Model (IAM)
Parry, et al (2009) Assessing the Costs of Adaptation to CC	$ 1,9 trilliion globally 2030	Used Stern's IAM, adjusting discount rate and means of vulnerability, plus added in costs of adaptive capacity
World Bank (2010)	$ 70- $100 billion developing countries 2050	Estimated the cost of climate proofing "climate-sensitive" investment flows
UNFCCC (2007) Investment flows report	$27-66 billion Developing countries 2030	
UNEP (2010) ADAPT Cost Report	$20-60 billion Africa 2030	Applied two different IAMs to Africa

Additional Cost of Mitigation

IEA 450 Scenario (WEO 2011)

- $15,2 trillion of additional cost over New Policies Scenario, growing from $160 billion today to $1,1 trilion in 2035
  - 40% of additional costs in transport;
  - 27% in buildings;
  - 20% in power generation
- Other spending in 450 scenario :
  - Fuel costs
    - Global fuel cost decreases $690 billion
    - Middle East sees $2,5 trilion increase
    - China/India see $1,4 trilion decrease
  - Subsidies
    - Fossil fuel subsidies : $4,1 trillion to $6,3 trillion
    - Renewable energy subsidies up $550 billion

Redrawing the Climate-Energy Map

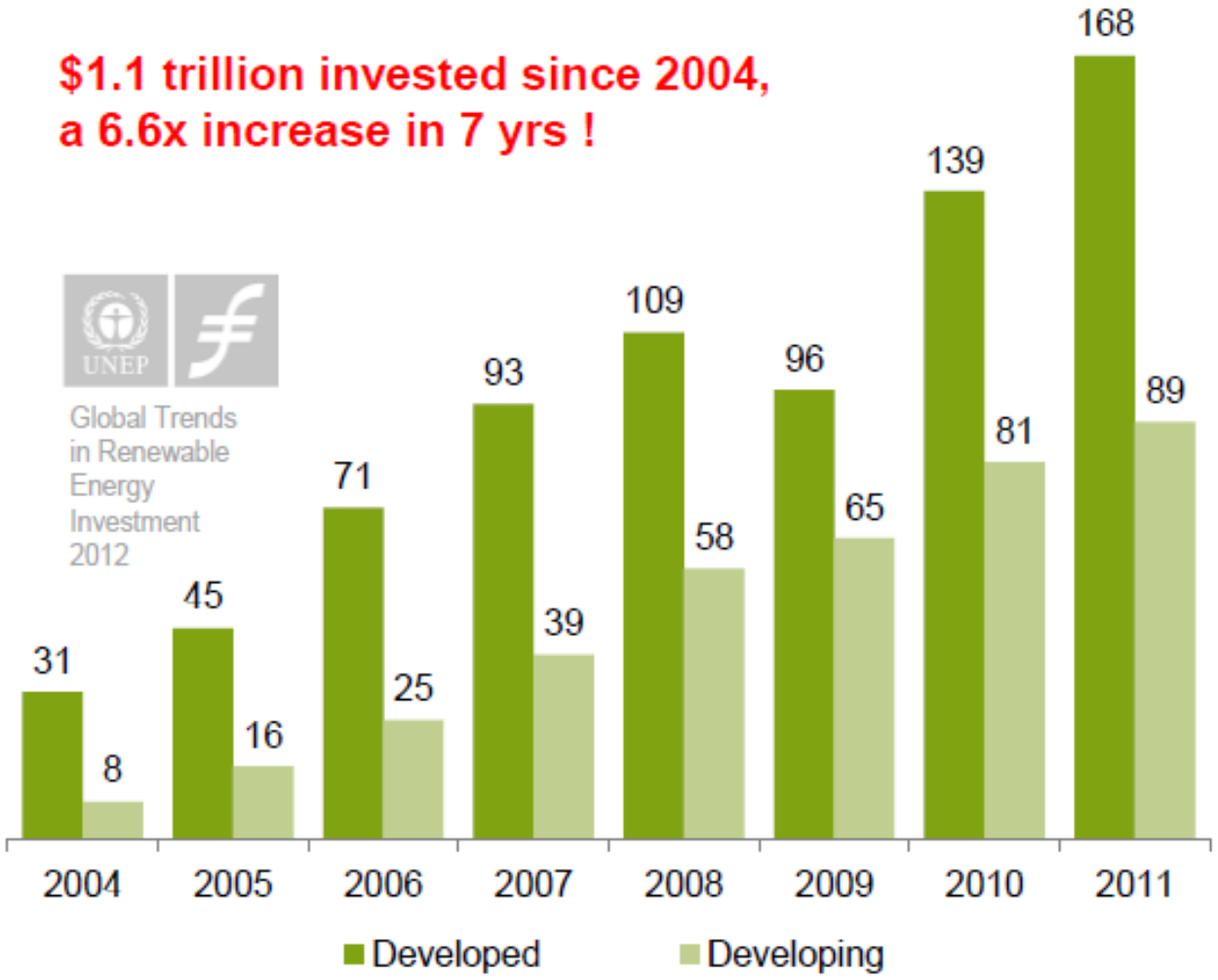
- Energy is at the heart of the challenge to meet the 2° C : **energy sector** accounts for around **2/3 of GHG emissions** as more than **80% of global energy consumption is based on fossil fuels**
- **Four policies** that could reduce significant greenhouse gases emissions :
  - Specific energy efficiency measures (49% of emissions savings)
  - Limiting the construction and use of the least-efficient coa;-fired power plants (21%)
  - Minimizing methane emissions from upstream oil and gas production (18%)
  - Accelerating the (partial) phase out of subsidies to fossil-fuel consumption (12%)

How Much Emissions Reduced? How Much Money 'Involved'?

- Energy efficiency : **1,5 Gt by 2020**, with additional investment of $ 200 billion
- Shifting the coal-fired plants : **640 Mt** in 2020
- Methane reduction at the upstream of oil and gas production : halved in 2020 (2010 : 1,1 Gt of emission)
- Partial phase out of fossil-fuel subsidies : **360 Mt. FFS** emounted to **$ 523b** in 2011, around 6 times at the level of support to RE
  - Currently : 15% of global CO2 emissions receive an incentive of $ 110 per tonne of FFS
  - Only 8% are subject to a carbon price

GLOBAL NEW INVESTMENT IN RENEWABLE ENERGY: DEVELOPED VS. DEVELOPING, 2004 – 11($BN)

Frankfurt School
UNEP Collaborating Centre
for Climate & Sustainable Energy Finance



Note: New investment volume adjusts for re-invested equity. Total values include estimates for undisclosed deals. Developed volumes are based on OECD countries excluding Mexico, Chile, and Turkey.

Source: Bloomberg New Energy Finance; UNEP

- Climate change could result a sudden and destructive impacts that pose risks to power plants and grids, oil and gas infrastructure, wind farms and other infrastructure.

Delaying stronger climate action to 2020 would come at a cost : **$ 1,5 trillion** in low carbon investments are avoided before 2020, but **$ 5 trillion** in additional investments would be required thereafter to get back on track.

Redrawing Climate-Energy Map, IEA 2013

Case Study : Indonesia Needs for Climate Finance for National Action on Adaptation

Estimasi Total Kebutuhan Pendanaan RAN-API

Bidang / Sub Bidang	Anggaran (milyar Rupiah)	
(1) Ketahanan Ekonomi		176.600,1
• Ketahanan Pangan	22.453,8	
• Kemandirian Energi	154.146,3	
(2) Ketahanan Sistem Kehidupan		193.764,2
• Kesehatan	122.742,9	
• Permukiman	13.428,1	
• Infrastruktur	57.593,2	
(3) Ketahanan Ekosistem		428.124,8
(4) Ketahanan Wilayah Khusus		40.290,9
• Perkotaan	37.987,4	
• Pesisir dan Pulau-Pulau Kecil	2303,5	
(5) Sistem Pendukung		1.532,0
Total Rencana Anggaran RAN-API		***840.312,0***

Sumber: Draft RAN-API, 28 Mei 2013

~ IDR : $ 84 trilion

Case Study for Mitigation

(in the context of 26% emission reduction voluntarily : Energy and Forestry sectors)

No.	Sources	Mitigation Needs (in USD)	Annual Mitigation Needs (in USD)
1	Mid-Term Development Plan, 2010	3.7 bn (2010-2014)	925 million
2	Second National Communication, 2009	8.3 bn (26%); 16.8 bn (41%)	0.83 bn –1.68 bn
3	NEEDS/ DNPI – McKinsey Cost Curve, 2009	385.2 bn (2010-2030)	19.26 bn
4	Bappenas, 2011	28.07 bn (RAN-GRK 2010-2020)	2.8 bn
5	CPEIR, 2012	70.5 bn (RAN-GRK until 2020)	7.05 bn

THANK YOU

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