Annex I. Glossary[184]

Account: a statement of recent transactions and the resulting balance. An account is a tool which records, for a given aspect of economic life, (a) the uses and resources or (b) the changes in assets and the changes in liabilities and/or (c) the stock of assets and liabilities existing at a certain time; the transactions accounts include a balancing item which is used to equate the two sides of the accounts (e.g. resources and uses) and which is a meaningful measure of economic performance in itself.

Adaptation: adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities[185]. Various types of adaptation can be distinguished:

- **Anticipatory adaptation**: Adaptation that takes place before impacts of climate change are observed. Also referred as proactive adaptation.
- **Autonomous adaptation**: An unconscious response to climatic change, triggered by automatic changes in a natural system and or in human systems. Also referred as spontaneous adaptation.
- **Planned adaptation**: Adaptation that is the result of a deliberate policy decision, based on available knowledge that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state[186].

Adaptive capacity: The potential or capability of a system to adapt to (to alter to better suit) climatic stimuli or their effects or impacts. There are six determinants of adaptive capacity[187]: 1) Economic resources; 2) Technology; 3) Information and skills; 4) Infrastructure; 5) Institutions; 6) Equity. Uncertainty surrounding adaptive capacity is one of the key limitations in estimating the costs of adaptation.

Adaptation cost estimate: Change in the total I&FF in measures that affect GHG emissions between the Baseline and Adaptation Scenarios.

Adaptation deficit: The lack of adaptive capacity to deal with climate change and variability. It's important to tackle any adaptation deficit before embarking on new adaptation activities[188].

Adaptive management: Adaptive management seeks to aggressively use management intervention as a tool to strategically probe the functioning of an ecosystem. Interventions are designed to test key hypotheses about the functioning of the ecosystem. Adaptive management identifies uncertainties, and then establishes methodologies to test hypotheses concerning those uncertainties. It uses management as a tool not only to change the system,

[184] More can be found online at http://unstats.un.org/unsd/sna1993/glossary.asp and http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/0_Overview/V0_2_Glossary.pdf
[185] IPCC, 2007
[186] IPCC, 2007
[187] Smit et al., 2001
[188] www.interclimate.co.uk

but as a tool to learn about the system. It is concerned with the need to learn and the cost of ignorance, while traditional management is focused on the need to preserve and the cost of knowledge.

Assets: Assets are entities functioning as stores of value and over which ownership rights are enforced by institutional units, individually or collectively, and from which economic benefits may be derived by their owners by holding them, or using them, over a period of time. (The economic benefits consist of primary incomes derived from the use of the asset and the value, including possible holding gains/losses that could be realised by disposing of the asset or terminating it[189]).

Baseline or 'Business as Usual' scenario: a standard measurement or fact against which other measurements or facts are compared, assumes no new additional measures are taken to address climate change.

Capital account: Records all transactions in non-financial assets.

Capital expenditure: A capital expenditure is incurred when a business spends money either to buy fixed assets or to add to the value of an existing fixed asset with a useful life that extends beyond the taxable year. Capex are used by a company to acquire or upgrade physical assets such as equipment, property, or industrial buildings.

Capital expenditure in the oil industry: To acquire or upgrade physical assets for oil production, transport (pipelines and other forms of transportation), and industrial buildings (refineries).

Capital expenditure in the gas industry: To acquire or upgrade physical assets for gas production, transport (pipelines and other forms of transportation), and industrial buildings (liquefied natural gas plants).

Capital stock – gross: The value of all fixed assets still in use at the actual or estimated current purchasers' prices for new assets of the same type, irrespective of the age of the assets.

Capital stock – net: The sum of the written-down values of all the fixed assets still in use is described as the net capital stock; it can also be described as the difference between gross capital stock and consumption of fixed capital.

Central bank: The public financial corporation which is a monetary authority; that is, which issues banknotes and sometimes coins and may hold all or part of the international reserves of the country.

[189] SNA93

Central government: The political authority of central government extends over the entire territory of the country; central government has the authority to impose taxes on all resident and non-resident units engaged in economic activities within the country.

Climate change scenarios: Coherent, internally-consistent and plausible descriptions of future climate given certain assumptions about the growth of GHG emissions and other factors that may influence climate in the future. The uncertainties associated with the modelling of future climate scenarios have been divided by the Hadley Centre into three broad categories: (1) emissions uncertainty; (2) natural climatic variability; and (3) modelling uncertainty[190].

CCS (carbon dioxide capture and storage): Set of technologies that can be used to collect carbon dioxide (CO_2) from industrial processes and power generation, separate and purify it, transport it to a storage site, and compress it to a form suitable for storage. Thus, CCS is a mitigation strategy based on capturing carbon dioxide (CO_2) from large point sources and storing emissions instead of releasing them into the atmosphere. It can be significant contributor to the emission reductions achieved under a Mitigation Scenario. However, before large-scale implementation of CCS can occur, technology development is still required, mainly related to CO_2 capture.

Corporation: A corporation is a legal entity, created for the purpose of producing goods or services for the market that may be a source of profit or other financial gain to its owner(s). It is collectively owned by shareholders who have the authority to appoint directors responsible for its general management.

Cultivated assets: Are livestock for breeding (including fish and poultry), dairy, draught, etc and vineyards, orchards and other plantations of trees yielding repeat products that are under the direct control, responsibility and management of institutional units.

Debt (international loans): any capital made across the border or offshore. Is an important additional financing source that provides resources to borrowers that have a demonstrated capacity to repay it. International debt includes loans provided by commercial banks and bond sales in the capital market. Commercial bank loans generally cover periods from a few days to a few years. Bonds generally have a longer maturity, ranging up to decades. Lenders generally want little risk and are prepared to accept lower returns than equity investors.

Note: There is no guarantee that international debt is invested in new physical infrastructure; the corporations and governments that borrow the money could use it for operating purposes. International debt represents almost 20% of total global investment and a reasonable share of the total investment made by governments and corporations.

[190] UKCIP

Direct investment enterprise – foreign: An incorporated or unincorporated enterprise in which a direct non resident investor owns more than 10% of the ordinary shares or voting power (for an incorporated enterprise) or the equivalent (for an unincorporated enterprise).

Economic sector: The economy may be classified into subdivisions, called sectors, which share the same or related products/services. Ten Economic Sectors are indentified in National Accounts, however, the 10 economic sectors for which Gross Fixed Capital Formation (GFCF) (and FDI) data are available do not always match the sectors used for the mitigation and adaptation analyses. Agriculture and forestry, for example, are analysed separately in this paper but are part of the same economic sector for GFCF and FDI data calculations:

1) Agriculture, hunting, forestry and fishing
2) Mining and quarrying
3) Manufacturing
4) Electricity, gas and water supply
5) Transport, storage and communications
6) Financial intermediation real estate, renting and business activities
7) Construction
8) Wholesale retail trade, repair of motor vehicles, motorcycles, etc., hotels and restaurants
9) Public administration and defense, compulsory social security
10) Education, health and social work, other community, social and personal services

Emissions sectors: Working Group III to the IPCC AR4[191] identified eight major GHG emission sectors (with the relative % contribution to global emissions):

1) Power Supply 21.0% (includes generation, and transfer and distribution)
2) Agriculture 14.0%
3) Transport 13.0%
4) Building 8.0%
5) Fossil Fuel supply 5.0%
6) Waste 3.0%
7) Industry 19.0%
8) Forestry 17.0%

Energy subsidies: Any government action that concerns primarily the energy sector that lowers the cost of energy production, raises the price received by energy producers or lowers the price paid by energy consumers[192].

Equity: Asset entailing ownership after all debts associated with that asset are paid off.

Financial corporations: Resident corporations or quasi-corporations principally engaged in financial intermediation or in auxiliary financial activities which are closely related to financial

[191] IPCC, 2007c
[192] International Energy Agency - IEA, 1999

intermediation. For example, banks and insurance companies that provides financial services to non-financial corporations, households and governments. They are typically responsible for 1–7% of the investment in new physical assets.

Financial flow: A financial flow entails an ongoing expenditure related to climate change mitigation or adaptation that does not involve investment in or acquisition of physical assets, such as forest management or health care.

Flows – economic: Reflect the creation, transformation, exchange, transfer or extinction of economic value; they involve changes in the volume, composition, or value of an institutional unit's assets and liabilities.

Foreign direct investment (FDI): The category of international investment that reflects the objective of a resident entity in one economy to obtain a lasting interest in an enterprise resident in another economy[193]. Since the analysis focuses on investment in new physical assets, two values of total FDI can be compiled for each country:

- **Inward FDI** as reported: equity investment in new physical assets and acquisition of existing physical and financial assets in the recipient country.
- **Adjusted FDI:** inward FDI as reported minus the value of international purchases in the recipient country, plus the value of international sales in the recipient country due to mergers and acquisitions (M&A).
- Data on inward FDI, but not M&A, are available by sector. As a result, FDI estimates for some sectors or regions are either large or small relative to the investment in new physical facilities.

Foreign exchange (total reserves): Total reserves comprises holdings of monetary gold, special drawing rights, IMF reserves positions and holdings of foreign exchange under the control of monetary authorities. The gold component of these reserves is valued at year-end (December 31), London prices. Data should be reported in current USD.

General circulation model (GCMs): Numerical models representing physical processes in the atmosphere, ocean, cryosphere and land surface. They are the most advanced tools currently available for simulating the response of the global climate system to increasing greenhouse gas concentrations. Only GCMs, possibly in conjunction with nested regional models, have the potential to provide geographically and physically consistent estimates of regional climate change which are required in impact analysis.

GHG intensity: Emissions per unit of output.

Governments: Governments are the national, provincial, state and local governments of a country. They invest in long-lived assets, such as transportation infrastructure, water supply,

[193] World Bank (2006a), World Bank (2006b) and ADB (2006); FDI by economic sector can be found from UNCTAD (2006a)

schools and hospitals, coastal infrastructure, and natural ecosystems. Governments are typically responsible for 10–15% of total investment in physical assets in a country.

Gross domestic product (GDP): the sum of the gross values added of all resident producers at basic prices, plus all taxes less subsidies on products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current USD. USD figures are converted from domestic currencies using single year official exchange rates[194].

Gross capital formation: is measured by the total value of the gross fixed capital formation, changes in inventories and acquisitions less disposals of valuables for a unit or sector.

Gross capital stock: Value of all fixed assets still in use, at the actual or estimated current purchasers' prices for new assets of the same type, irrespective of the age of the assets.

Gross fixed capital formation (GFCF): Is the spending on new physical assets in a country during a specified year and is reported in a country's national accounts. Measured by the total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period plus certain additions to the value of non-produced assets (such as subsoil assets or major improvements in the quantity, quality or productivity of land) realised by the productive activity of institutional units. According to the 1993 System of National Accounts prepared by the Inter-Secretariat Working Group on National Accounts, net acquisitions of valuables are also considered capital formation. GFCF is the most comprehensive and consistent measure of current investment in physical assets available[195].

GNI (gross national income): GDP less net taxes on production and imports, less compensation of employees and property income payable to the rest of the world plus the corresponding items receivable from the rest of the world (in other words, GDP less primary incomes payable to non-resident units plus primary incomes receivable from non-resident units); an alternative approach to measuring GNI at market prices is as the aggregate value of the balances of gross primary incomes for all sectors; (note that GNI is identical to gross national product (GNP) as previously used in national accounts generally).

Industry sector: A group of establishments/enterprises engaged on the same, or similar, kinds of production activity Note: petroleum refining is covered in energy supply, emissions associated with electricity generation are included in the energy supply sector. Regarding the

[194] Data sources: World Bank (2006a) and UNSTAT (2006). The UNSTAT data were used for those countries for which there was no data in the WDI report

[195] The GFCF sources, for which data were available, are typically: 1. Household (including non-profit institutions serving households); 2. Corporations (financial and non-financial); and 3. Government. Data sources: World Bank (2006a) database and UNSTAT (2006). The UNSTAT data were used for those countries for which there was no data in the WDI report. Data in the national currency can be converted to USD using the exchange rates from the International Financial Statistics (IFS) database of the International Monetary Fund (IMF). Missing values can be estimated using a regression equation. Regression analysis was conducted using the observed values of GFCF with GDP as the explanatory variable.

worldwide industry sector, the key regulatory mechanism required is to ensure that CO_2 abatement opportunities are pursued in the industrial sector, a stable financial incentive to invest in low GHG emitting technology, such as a CO_2 price.

Households: Households small group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food. Households are responsible for 15–35% of total global investment, all of which is assumed to come from domestic sources. However, remittances by family members working in foreign countries are substantial for some countries and could help fund household investment in the recipient countries.

Investment: the purchase by a producer of a physical asset, such as durable equipment or inventory, in the hope of improving future business or with an expectation of favourable future returns, such as the capital cost of a gas-fired generating unit or a water supply system.

Land under cultivation: Land on which agricultural or horticultural production is carried on for commercial or subsistence purposes, including, in principle, land under plantations, orchards and vineyards.

Limits to Adaptation: Adaptation can considerably reduce the adverse impacts of climate change but cannot eliminate them.

Loans: Financial assets that are created when creditors lend funds directly to debtors, that are evidenced by non-negotiable documents, or for which the lender receives no security evidencing the transaction.

Maladaptation: Actions taken that tend to increase vulnerability to climate change, contrary to original intent.

Machinery and equipment (assets): Consists of transport equipment (assets) and other machinery and equipment other than that acquired by households for final consumption.

Major renovations or enlargements (of fixed assets): Activities which increase the performance or capacity of existing fixed assets or significantly extend their previously expected service lives and so are classified as part of gross fixed capital formation; the decision to renovate, reconstruct or enlarge a fixed asset is a deliberate investment decision which may be undertaken at any time and is not dictated by the condition of the asset (note the contrast between this item and "maintenance and repairs").

Mitigation: An anthropogenic intervention to reduce the sources or enhance the sinks of GHGs[196].

[196] IPCC, 2007

Mitigation cost estimate: Change in the total I&FF in measures that affect GHG emissions between the Baseline and Mitigation Scenarios.

National accounts: A complete and consistent conceptual framework for measuring the economic activity of a nation. The national account broadly presents the production, income and expenditure activities of the economic actors (corporations, government, and households) in an economy, including their relations with other countries' economies and wealth.

The most recent year for which national accounts data is available for a large number of countries is 2000 – countries may be, however, encouraged to compile information for a more recent year such as 2005. Many countries report the sources and/or economic sectors based on internationally agreed definitions; the four sources and 10 economic sectors* are listed in the following table:

Sources	Economic sectors
Households	Agriculture, hunting, forestry and fishing
Government	Mining and quarrying
Financial corporations	Manufacturing
Non-financial corporations	Electricity, gas and water supply
	Transport, storage and communications
	Financial intermediation real estate, renting and business activities
	Construction
	Wholesale retail trade, repair of motor vehicles, motorcycles, etc., hotels and restaurants
	Public administration and defence, compulsory social security
	Education, health and social work, other community, social and personal services

* The 10 economic sectors for which data are available do not always match the sectors used for the mitigation and adaptation analyses. Agriculture and forestry, for example, are analysed separately in this paper but are part of the same economic sector in the National Accounts.

Net: Common means of referring to values after deducting consumption of fixed capital (generally used as in 'net capital stock' or 'net domestic product'); all the major balancing items in the accounts from value added through to saving may be recorded gross or net; it should be noted, however, that the term 'net' can be used in different contexts in the national accounts, such as 'net income from abroad' which is the difference between two income flows.

Net official development assistance (ODA): Disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC) of the Organisation for Economic Co-operation and Development, by multilateral institutions and by non-DAC countries. ODA includes loans with a grant element of at least 25% (calculated at a rate of discount of 10%). Only infrastructure-related ODA flows in different sectors defined in the Creditor Reporting System database of the

Organization for Economic Co-operation and Development (OECD) are considered for capital investment analysis[197].

Non-financial assets: Entities, over which ownership rights are enforced by institutional units, individually or collectively, and from which economic benefits may be derived by their owners by holding them, or using them over a period of time, that consist of tangible assets, both produced and non-produced, and most intangible assets for which no corresponding liabilities are recorded.

Non-financial corporations: corporations whose principal activity is the production of market goods (such as fossil fuels) or non-financial services (such as communications services). They need physical facilities such as commercial buildings, industrial plants, and telecommunications facilities to provide the goods and services they offer.

Non-financial quasi-corporations: Quasi-corporations whose principal activity is the production of market goods or non-financial services.

Private investment: Expenditures made by financial institutions and corporations, excluding public sector investment and R&D (whether funded by companies or governments).

Private investment in energy: Infrastructure expenditures in energy (fossil fuels, electricity and natural gas production, transport and distribution) that have reached financial closure and directly or indirectly serve the public. Movable assets and small projects such as windmills are excluded.

Purchasing-power parity (PPP): The number of currency units required to buy goods equivalent to what can be bought with one unit of the currency of the base country or with one unit of the common currency of a group of countries. Also referred to as Purchasing Power Standard. The PPP may be calculated over all of GDP, but also at levels of aggregation, like capital formation.

Sensitivity: Sensitivity is the degree to which a system is affected, either adversely or beneficially, by climate variability or change. The effect may be direct (e.g., a change in crop yield in response to a change in the mean, range or variability of temperature) or indirect (e.g., damages caused by an increase in the frequency of coastal flooding due to sea-level rise)[198].

Social accounting matrix (SAM): Means of presenting the SNA accounts in a matrix which elaborates the linkages between a supply and use table and institutional sector accounts; a typical focus of a SAM on the role of people in the economy may be reflected by, among other things, extra breakdowns of the household sector and a disaggregated representation of labour markets (i.e., distinguishing various categories of employed persons).

[197] UNFCCC (2007); OECD (2007)
[198] IPCC 4AR (2007)

Subsidies: Current unrequited payments that government units, including non-resident government units, make to enterprises on the basis of the levels of their production activities or the quantities or values of the goods or services which they produce, sell or import. Subsidies are introduced for specific social, economic or environmental reasons, for example to provide affordable energy to low income groups, to stimulate R&D of energy technologies, or to reduce pollution by promoting renewable energy.

System of National Accounts (SNA): Consists of a coherent, consistent and integrated set of macroeconomic accounts, balance sheets and tables based on a set of internationally agreed concepts, definitions, classifications and accounting rules.

T&D (transmission and distribution) losses: electric loss due to transmission and distribution. These losses consist of both technical losses, such as transmission line loss, and non-technical losses, such as theft. Utilities generally try to minimize non-technical losses but some government owned utilities may tolerate non-technical losses as a socio economic policy; that is, providing electricity to low-income groups.

Transport equipment (as assets): Equipment for moving people and objects, other than any such equipment acquired by households for final consumption.

Transport sector: Includes passenger and freight movements by road vehicles, railways, aircraft, and both inland and maritime vessels. For aircraft and marine transport, both domestic and international energy use and emissions are included. As might be expected with estimates from different data sources, there are some differences in the data characterizing the transportation sector. To maintain consistency throughout the full document, the IPCC 2007 document adopted the IEA estimates.

Value added – gross: The value of output less the value of intermediate consumption; it is a measure of the contribution to GDP made by an individual producer, industry or sector; gross value added is the source from which the primary incomes of the SNA are generated and is therefore carried forward into the primary distribution of income account.

Value added – net: Is the value of output less the values of both intermediate consumption and consumption of fixed capital.

Vulnerability: Vulnerability is the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity[199].

[199] IPCC 4AR (2007)

Water resources: Aquifers and other groundwater resources to the extent that their scarcity leads to the enforcement of ownership and/or use rights, market valuation and some measure of economic control.

Water sector: Comprises the demand and supply for water resources. Investment in this sector, includes expenditures related with the construction of additional infrastructure (reservoirs, wells, desalination, re-use facilities) needed to meet the projected demand for water supplies given the expected climate change, projected population and economic growth under the different scenarios.