En route to the first Air Emission Accounts for South Africa

National NCA Forum

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Parallel session 4B: Climate related accounts and data foundations

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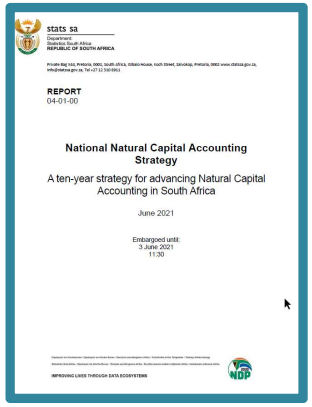
Stats SA work program 2024/2025 and measuring climate change

- One of the world realities is that the world climate has changed and this is seen in a series of disasters, which are negatively affecting the lives of people.
- As a water-scarce country, South Africa is particularly vulnerable to the impacts of climate change.
- The measurement of climate change and its impact on the economy and society is a growing area of concern.
- The key risk remains the fiscal challenge to implement the National NCA Strategy as the organisation has limited resources to coordinate the development of various environmental accounts.

Air Emissions Accounts for South Africa – Why?

Implementation of South Africa's National NCA Strategy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REPORT
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National Natural Capital Accounting Strategy

A ten-year strategy for advancing Natural Capital Accounting in South Africa

June 2021

Embargoed until:
3 June 2021
11:30

IMPROVING LIVES THROUGH DATA ECOSYSTEMS

Output	High-level indicative activities		Funding scenario	Key role players	Timeframe	Resources
3.1.3. Accounts related to carbon and greenhouse gas emissions	3.1.3.1	Compile and publish the biennial South African Greenhouse Gas (GHG) Emission Report and GHG inventory for submission under the UNFCCC	Low road	DFFE	Biennially	Existing climate change monitoring and evaluation team
	3.1.3.2	Produce spatially explicit accounts of carbon and greenhouse gas emissions (including feasibility study of what type of accounts and resolution most relevant to carbon taxes, carbon trading)	Low road	DFFE, National Treasury, Stats SA, DMRE		Existing climate change monitoring and evaluation and carbon tax teams
	3.1.3.3	Regularly produce selected accounts of carbon and greenhouse gas emissions	High road	DFFE, Stats SA, relevant NGOs, potentially SAWS, Dept of Health		

IMF G20 Data Gaps Initiative 3 – Theme: Climate Change – Recommendation 1

G20 DATA GAPS INITIATIVE 3
DELIVERING INSIGHTS FOR ACTION

(i) Climate Change Theme

Rec 1: GHG Emission Accounts and national carbon footprints.
Rec 2: Energy Accounts.
Rec 3: Carbon footprint of FDI.
Rec 4: Climate finance.
Rec 5: Forward looking physical and transition risk indicators.
Rec 6: Government climate impacting subsidies.
Rec 7: Climate change mitigation and adaptation current and capital expenditures.

IMF-SECO Statistics Capacity Development Program

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South African Reserve Bank

Eskom

INTERNATIONAL MONETARY FUND

South African Weather Service

sasol

Air Emission Accounts – what are we measuring?

Air emmision accounts measure flows *to the environment*

Emissions
flows of pollutants to the air

→ Air emission statistics and accounts

***NOT* air quality**
Concentrations of pollutants in the air

→ Statistics on air quality

Air Emission Accounts - Characteristics

- Record all emissions related to economic activity
- Emissions are recorded consistent with national accounts´ principles and classifications
- Production activities classified by ISIC, etc.
- Emissions from transport activities should be allocated by industries and households
- Residence principle
  - *Exclude* emissions released within the national territory by non-residents
  - *Include* emissions abroad of resident economic units.
    - Example: Emissions from air transport: Emissions of a flight of Ryanair from Frankfurt to New York is recorded in the Irish accounts because Ryanair is resident in Ireland.

Air Emission Accounts – what do we want to achieve (end product and time-series)

- The accounts include incidental and undesired gaseous and particulate substances released to the atmosphere by industries and households as a result of production, consumption and accumulation processes.
- Air Emissions Accounts records generation by resident economic units and by type of substance.
- What will be our time series? 2010 to latest year – IMF DGI 3 target?

Table 3.7
Air emissions account *(tonnes)*

Air emissions account (tonnes)

Where do they go?

Who releases them?

Pollutants

	Supply table for air emissions										Use table for air emissions	
	Generation of emissions								Accumulation		Flows to the environment	
	Industries—by ISIC					Households						
	Agriculture ISIC A	Mining ISIC B	Manufacturing ISIC C	Transport ISIC H	Other	Transport	Heating	Other	Emissions from landfill	Total supply of emissions	Emissions released to the environment	Total use of emissions
Type of substance												
Carbon dioxide	10 610.3	2 602.2	41 434.4	27 957.0	82 402.4	18 920.5	17 542.2	1 949.1	701.6	204 119.6	204 119.6	204 119.6
Methane	492.0	34.1	15.8	0.8	21.9	2.4	15.5	1.7	222.0	806.3	806.3	806.3
Dinitrogen oxide	23.7		3.5	0.8	2.6	1.0	0.2	0.1	0.1	32.0	32.0	32.0
Nitrous oxides	69.4	6.0	37.9	259.5	89.0	38.0	12.1	1.3	0.3	513.6	513.6	513.6
Hydrofluorocarbons			0.3		0.4					0.7	0.7	0.7
Perfluorocarbons												
Sulphur hexafluoride												
Carbon monoxide	41.0	2.5	123.8	46.2	66.2	329.1	51.2	5.7	1.1	666.9	666.9	666.9
Non-methane volatile organic compounds	5.2	6.5	40.0	16.4	27.2	34.5	29.4	3.2	0.9	163.3	163.3	163.3
Sulphur dioxide	2.7	0.4	28.0	62.4	8.1	0.4	0.4	0.1	0.0	102.5	102.5	102.5
Ammonia	107.9		1.7	0.2	0.9	2.3	11.4	1.2	0.2	125.9	125.9	125.9
Heavy metals												
Persistent organic pollutants												
Particulates (including PM10 and dust)	7.0	0.1	8.5	9.3	4.4	6.0	2.8	0.5	0.0	38.5	38.5	38.5

System of Environmental-Economic Accounting 2012—Central Framework

Boundary – what is in and what is out?

Include emissions generated by economic activity

- All emissions from transformation and end use of energy including from combustion of biomass (e.g. wood fuel)
- Emissions form incineration of waste
- Flaring and venting of natural gas
- Methane emissions from livestock (enteric fermentation)
- Emissions from chemical processes, evaporation of solvents, etc.
- Emissions from manure collected and spread on agricultural land (dissipative use)
- Emissions from soil disturbances through e.g. cultivation, construction and land clearance
- Emissions from landfills
- Leakages from accumulations

  Emissions from durable goods like refrigerators should be recorded as they occur and attributed to the owner of the goods

Exclude emissions *in* the environment

- Transboundary flows of air emissions
- Capture of gases by the environment, e.g. capture in forets and soil
- Emissions from unintended forest and grassland fires
- Secondary emissions resulting from processes in the atmosphere

Flows within the economy may be recorded in a separate table

- Substances captured for use in other production processes
  - Carbon capture and storage
  - Methane captured to generate biogas

Differences between GHG inventories and Air Emission Accounts

GHG Inventory (IPCC)	Air Emissions Accounts (SEEA CF)
Territorial principle	Residence principle
Process-based allocation of emissions	Allocation of emissions to economic activities
Breakdown by sectors: energy, industrial processes; solvent and other product use; agriculture; land use, land-use change and forestry (LULUCF); waste; other)	Breakdown by industries (ISIC) and households
Functional allocation of transport emissions within the energy sector	Allocation of transport emissions to industries and households

Differences between GHG inventories and Air Emission Accounts presented in a 'bridge' table

Generic bridge table

Total air emissions according to SEEA air emissions accounts

Less national residents abroad

- land transport
- water transport and fishing vessels
- air transport

plus non-residents on the territory

- land transport
- water transport (inland) and fishing vessels
- air transport (inland)

plus other adjustments and statistical discrepances

= Total air emissions, excl. LULUCF according to UNFCC/IPCC /CLRTAP

+ LULUCF

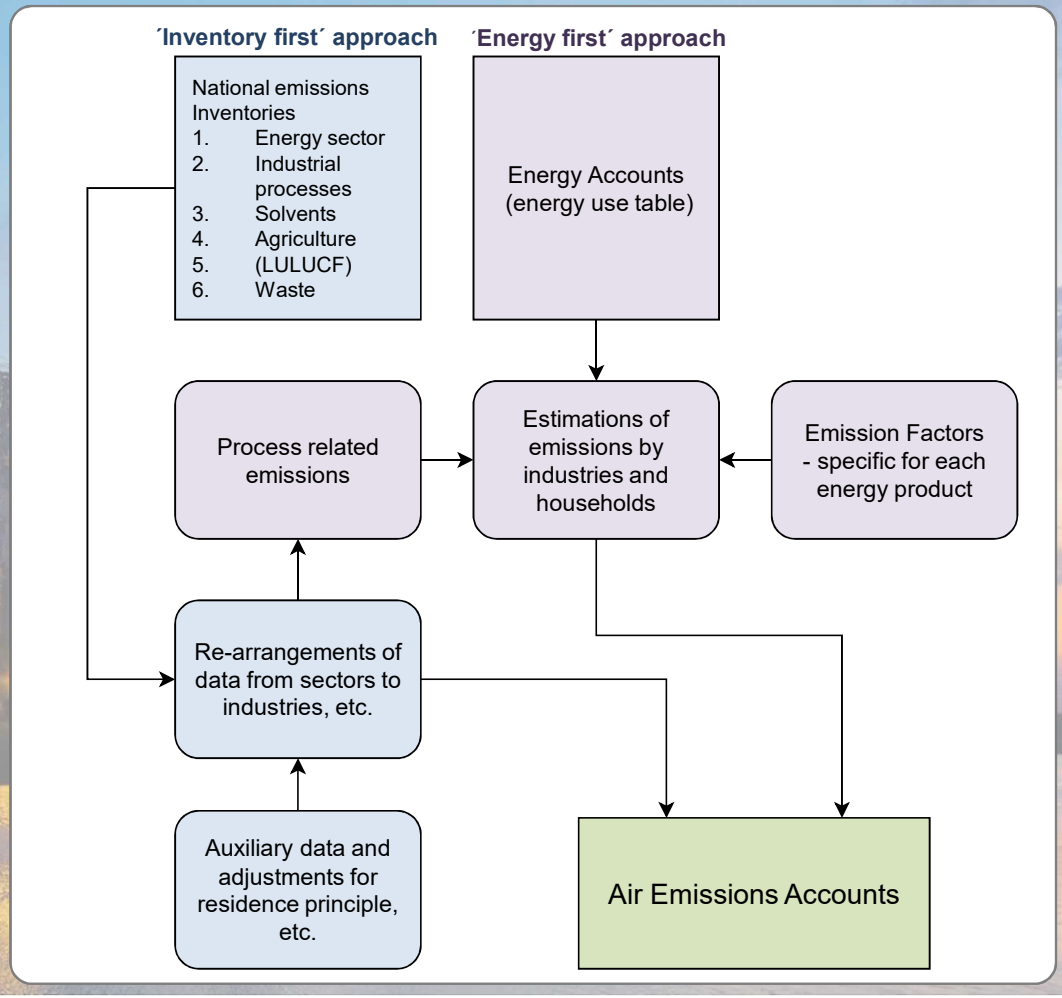
= Total air emissions, incl. LULUCF according to UNFCC/IPCC /CLRTAP

Example: Danish CO2-emissions

	1000 tonnes
Emissions from Danish economic activities (SEEA)	**69 250**
Less emissions abroad (international transport)	**- 39 584**
Emissions caused by Danish operated ships abroad	*- 37 195*
Emissions caused by Danish operated planes abroad	*- 571*
Emissions caused by Danish operated vehicles abroad	*- 1 818*
Plus other differences in emissions from transport and cross border trade	188
Emissions originating from the Danish territory (UNFCCC/UNECE)	29 854
Land use, land use change and forestry (LULUCF)	2 089
Emissions originating from the Danish territory inclusive LULUCF	31 943

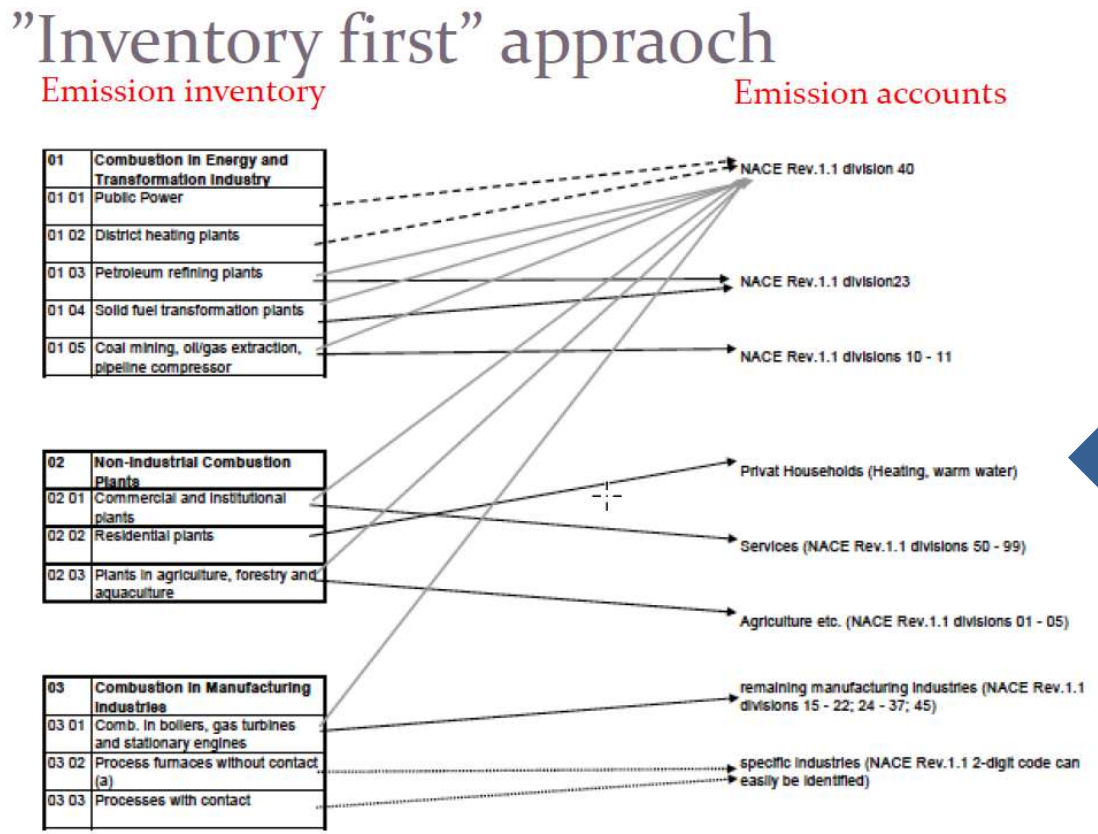
Bridge tables are very important for both compilers and users

The two approaches to compile Air Emission Accounts



Air Emission Accounts – what approach do we want to follow in South Africa

SASQAF of the GHG inventory data – process of engagement between DFFE and Stats SA SANSS started allready.



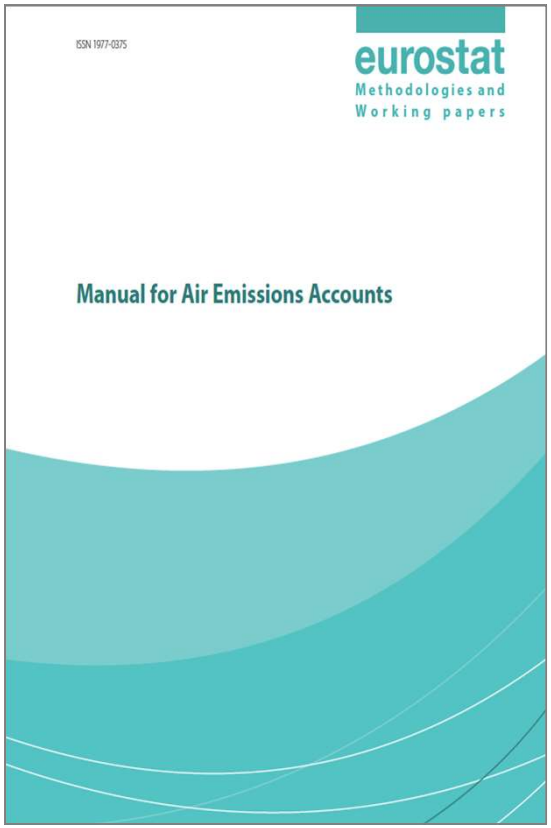
Improvement: DFFE data provider (GHG inventory) already busy with work on the GHG inventory system to link IPCCC to ISIC – Stats SA then to link ISIC to SIC

First Air Emission Accounts for South Africa

The proposed way forward and timelines – to release the first AEA for South Africa by latest March 2026

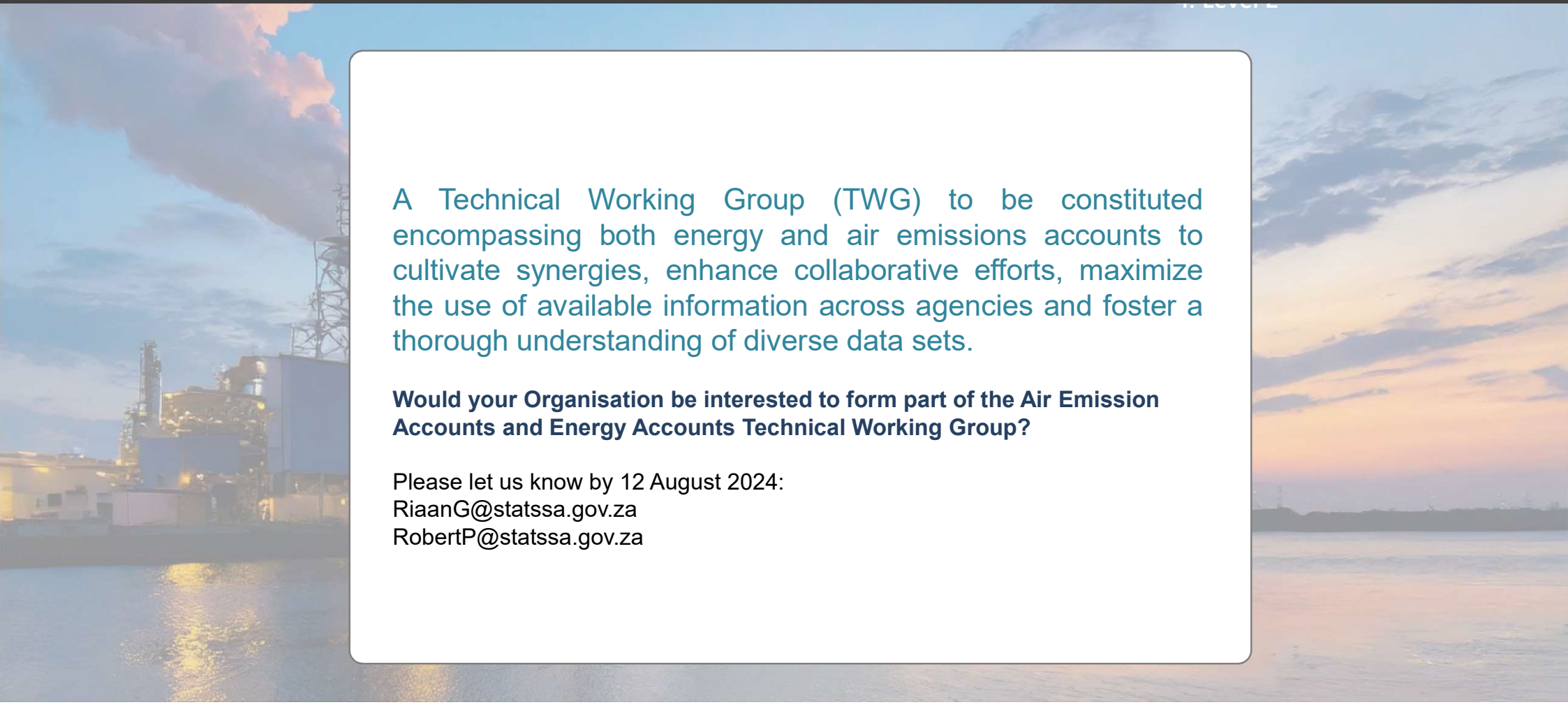
	2024									2025												2026		
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
GHG inventory system owner to link IPCCC to ISIC – Stats SA then to link ISIC to SIC																								
SASQAF of GHG Inventory data																								
Investigate further other complimentary data sources that could be used																								
Develop first draft AEA Excel based compilation system																								
Constitute an AEA TWG led by Stats SA EEA Directorate																								
Refine AEA system, develop AEA Discussion Document and Excel for the web (NC series release 7)																								

Guidance for implementation



https://ec.europa.eu/eurostat/web/products-manuals-and-guidelines/-/KS-GQ-15-009

AEA and PEFA Technical Working Group



A Technical Working Group (TWG) to be constituted encompassing both energy and air emissions accounts to cultivate synergies, enhance collaborative efforts, maximize the use of available information across agencies and foster a thorough understanding of diverse data sets.

Would your Organisation be interested to form part of the Air Emission Accounts and Energy Accounts Technical Working Group?

Please let us know by 12 August 2024:
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Thank you

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