

Introduction

Country X is rapidly developing and the energy sector has been one of the main drivers of economic growth. Given the important role of energy, there has been an increased demand for relevant information to aid in the development of policy and have a better understanding of the role of energy in improving well-being.

As part of its development plans, country X aims to exploit efficiently its energy resources for use by current and future generations, and have policies in place for the reduction of emission in order to meet its commitments to the various international multilateral environment agreements.

Energy information system

The national statistical office in close collaboration with the planning ministry, energy ministry and finance ministry has worked towards developing an energy information system in order to support the various policy initiatives. Data is collected from a variety of sources including various surveys and administrative data. The data is then used to compile the energy balances and the energy accounts using internationally agreed methodology.

Presenting the energy accounts in physical terms

Based on the SEEA Technical Note on Energy, the NSO using information from a number of data providers has produced Table 1 of the annex to trace the supply and use of energy in the country.

- In looking at the data in the supply and use, what are some useful aggregates?
- What additional information would be useful to provide more context that would be relevant for policy purposes?

Table 2 contains information from the asset accounts.

- What is the links between the supply and use table and the asset account?
- What type of analysis can be done when putting together the information in the supply and use table and the asset account?
- What type of monetary information would be useful for policy purpose?

Indicators with a focus on SDGs

Since the data is collected using the same industry classification and scope as the national accounts, links can be made to monetary data from the national accounts. In particular table 3 contains the value added generated by each sector of the economy for the same period as the energy accounts. This information will be relevant for the SDG discussion below.

As currently formulated, goal 7 calls for “ensure[ing] access to affordable, reliable, sustainable and modern energy for all”. Our focus will be on 7.2 and 7.3.

7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption
7.3 By 2030, double the global rate of improvement in energy efficiency	7.3.1 Energy intensity measured in terms of primary energy and GDP

Indicator 7.2—In practical terms, the numerator can be thought of as the total energy used that comes from renewable sources. The denominator is the total energy used. How can this be calculated from the information we have? Assume that 60% of energy from solid waste comes from renewable sources. Additional information is available in table 4 of Annex.

Indicator 7.3—How can the accounts be used to calculate this indicator? What would be the value added of time-series data?

Extending to the emission accounts (time permitting)

Compiling emission accounts resulting from the consumption of energy products can be easily done once the physical supply and use table has been compiled. For each energy product, there is a typical emission factor. Multiplying the emission factor by the amount of energy used gives the emissions resulting from the use of the energy products

Energy product	Emission factor (ton CO ₂ /TJ)
Coal	96
Natural Gas	53
Oil	84
Biofuels	110
Waste	100

Using the above information what are the emissions resulting from the use of energy?

Annex: Table 1 Supply and use in physical terms

PHYSICAL SUPPLY TABLE (unit:PJ)								Accumulation	Flows from the rest of the World (Imports)	Flows from the environment	TOTAL	
Production (incl. household own account) & generation of residuals												
Industries (by ISIC)							Households					
Agriculture Forestry & Fishery	Mining & Quarrying	Manufacturing	Electricity, gas, steam & air conditioning supply	Transportation & Storage	Other Industries	Total Industry						
(ISIC A)	(ISIC B)	(ISIC C)	(ISIC D)	(ISIC H)								
1. Energy from natural inputs:												
Natural resource inputs												
Oil resources										744	744	
Natural gas resources										417	417	
Timber resources										5	5	
Inputs of energy from renewable sources										124	124	
Other natural inputs (cultivated biomass)										2	2	
2. Energy Products:												
Production of energy products by SIEC class:												
Coal									225		225	
Peat and peat products												
Oil shale / oil sands												
Natural gas		395		369		764					764	
Oil		721	347			1068			930		1998	
Biofuels	5			2		7					7	
Waste	39		55			94			17		111	
Electricity				212		212			22		234	
Heat				79		79					79	
Nuclear fuels and other fuels												
3. Energy Residuals:												
Energy residuals from end use	50	3	419	91	632	96	1291	240			1531	
Energy residuals from losses		45	13	216			274				274	
4. Other Residual Flows:												
Residuals from end-use for non-energy purposes			51								51	
Energy from solid waste								94			94	
5. TOTAL SUPPLY												
	94	1164	885	969	632	96	3840	240	94	1194	1292	6660

PHYSICAL USE TABLE (unit: PJ)		Intermediate consumption, use of energy resources, receipt of energy losses						Final Consumption	Accumulation	Flows to the rest of the World (Exports)	Flows to the environment	TOTAL	
		Industries (by ISIC)											Households
		Agriculture Forestry & Fishery	Mining & Quarrying	Manufacturing	Electricity, gas, steam & air conditioning supply	Transportation & Storage	Other Industries	Total Industry					
		(ISIC A)	(ISIC B)	(ISIC C)	(ISIC D)	(ISIC H)							
1. Energy from natural inputs:													
Natural resource inputs													
	Oil resources		744									744	
	Natural gas resources		417									417	
	Timber resources	5										5	
Inputs of energy from renewable sources					124							124	
Other natural inputs (cultivated biomass)					2							2	
2. Energy Products:													
Transformation of energy products by SIEC class:													
	Coal				223			223				223	
	Peat and peat products												
	Oil shale / oil sands												
	Natural gas				482			482				482	
	Oil			360	16			376				376	
	Biofuels												
	Waste				31			31				31	
	Electricity												
	Heat												
	Nuclear fuels and other fuels												
End-use of energy products by SIEC class:													
	Coal	2		17				19	1	-20	2	2	
	Peat and peat products												
	Oil shale / oil sands												
	Natural gas	2		39			12	53	26	2	201	282	
	Oil	34	2	326		621	49	1032	102	-3	441	1572	
	Biofuels				2			2	5			7	
	Waste	3		4	37		1	45	33		1	79	
	Electricity	7	1	22	50	10	15	105	29		100	234	
	Heat	2		11	2	1	19	35	44			79	
	Nuclear fuels and other fuels												
End-use of energy products for non-energy purposes				51				51				51	
3. Energy Residuals:													
Energy residuals from end use											1531	1531	
Energy residuals from losses											274	274	
4. Other residual flows:													
Residuals from end-use or non-energy purposes									51			51	
Energy from solid waste		39		55								94	
5. TOTAL USE		94	1164	885	969	632	96	3840	240	30	745	1805	6660

Table 2 Asset account for energy resources

	Type of Energy Resource	
	(Class A: Comercially recoverable resources)	
	Oil Resources (PJ)	Natural Gas Resources (PJ)
Opening stock of mineral and energy resources	16000	12000
Additions to stock:		
Discoveries		
Upward appraisals		2000
Reclassifications		
TOTAL ADDITIONS TO STOCK		2000
Reductions in Stock:		
Extractions	744	417
Catastrophic losses		
Downwards reappraisals		
Reclassifications		
TOTAL REDUCTIONS IN STOCK	744	417
Closing Stock of mineral and energy resources	15256	13583

Table 3 Value added and employment

	Industries (by ISIC)							Rest of the World	Final Consumption and other		Taxes less subsidies on products, trade and transport margins	TOTAL
	Agriculture, Forestry & Fishery	Mining & Quarrying	Manufacturing	Electricity, gas, steam & air conditioning supply	Transportation & Storage	Other Industries	Total Industry		Accumulation	Households		
	(ISIC A)	(ISIC B)	(ISIC C)	(ISIC D)	(ISIC H)							
3. Gross value added (currency)	8659	10526	5546	21407	35063	738690	819891					819891
4. Employment (thousands)	145	148	78	165	374	9921	10831					10831

Table 4: Renewable and non-renewable energy products

Product	Renewable (R) / Non-renewable (NR)
Coal	NR
Peat and peat products	NR
Oil shale / oil sands	NR
Natural gas	NR
Oil	NR
Biofuels	R
Waste	R/NR
Electricity	
Heat	
Nuclear fuels and other fuels n.e.c.	