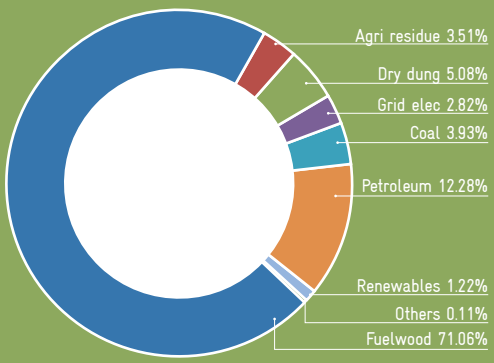
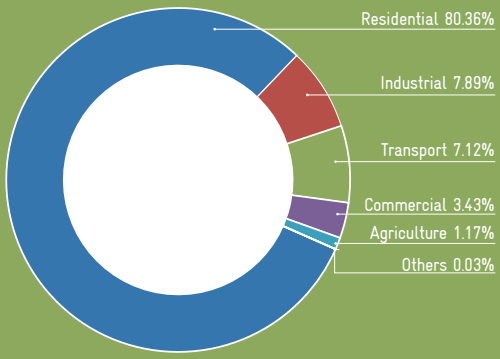
Energy Consumption Situation in Nepal (Year 2011/12)
(Total Consumption = 376.3 million GJ)

ENERGY CONSUMPTION BY FUEL TYPE



ENERGY CONSUMPTION BY ECONOMIC SECTORS



Energy Data Sheet

Water and Energy Commission Secretariat (WECS), June 2014

ABBREVIATIONS

AEPC	Alternative Energy Promotion Center
ATF	Aviation Turbine Fuel
BMZ	Bundesministerium für Wirtschaftliche Entwicklung und Zusammenarbeit Federal Ministry of Economic Cooperation and Development
CDR	Central Development Region
DDC	District Development Committee
DoED	Department of Electricity Development
DoMG	Department of Mines and Geology
ED	Energy Division
EDR	Eastern Development Region
ETFC	Electricity Tariff Fixation Commission
FO	Furnace Oil
FWDR	Far Western Development Region
GIZ	Deutsche Gesettschaft für lnternationale Zusammenarbeit GmbH
GJ	Giga Joules
kcal	kilocalorie
kl	thousand liters
LPG	Liquefied Petroleum Gas
MoA	Ministry of Agriculture
MoCS	Ministry of Commerce and Supplies
MoE	Ministry of Energy
MoSTE	Ministry of Science, Technology and Environment
MoFALD	Ministry of Federal Affairs and Local Development
MoFSC	Ministry of Forest and Soil Conservation
MoI	Ministry of Industry
MT	Metric Ton
MVA	Million Volt Ampere
MW	Mega Watt
MWDR	Mid-Western Development Region
MWh	Mega Watt Hour
NEA	Nepal Electricity Authority
NEEP	Nepal Energy Efficiency Programme
NEIS	Nepal Energy Information System
NGO	Non-Governmental Organization
NOC	Nepal Oil Corporation
tce	tons of coal equivalent
TCN	Timber Corporation of Nepal
toe	tons of oil equivalent
VDC	Village Development Committee
WDR	Western Development Region
WEC	Water and Energy Commission
WECS	Water and Energy Commission Secretariat
Wp	Watt Peak

FOREWORD

A very warm welcome to our very first issue of Energy Data Sheet !

Water and Energy Commission Secretariat (WECS) has been involved in the collection and analysis of the energy related data since its establishment. However, this is the first time we have come with a very comprehensive energy data sheet. The data sheet aims to present the energy supply situation of Nepal and also the consumption pattern in all economic sectors. Data, as we all know, is a pre-requisite for formulating all policies and plans. This data sheet is, therefore, believed to be useful for all involved in national energy planning. With a view to making the energy data more accessible, valid and reliable, WECS has been working in the establishment of Energy Information System and we shall be publishing this data sheet annually.

For this first issue we have compiled the data collected in the Survey which WECS conducted for the year 2011/2012. The full report of this data sheet is available at WECS library. This issue contains all forms of energy supply situation in the country and the consumption pattern in all the economic sectors by fuel type and by end use. We believe that the information shall be useful to the policymakers, researchers, students, project developers academia and international energy communities at large.

We would also like to take this opportunity to acknowledge the support of the German Development Cooperation – GIZ in establishment of Nepal Energy Information System (NEIS) and also publication of this data sheet under Nepal Energy Efficiency Programme (NEEP). NEEP is a Nepali-German programme executed by WECS and supported by GIZ on behalf of the Federal Ministry of Economic Cooperation and Development (BMZ).

We request you to take some time to give a thought over the layout and the content of this issue and we highly appreciate any suggestions, observations and remarks on this issue so that we have more improved issues in the future.

Sriranjan Lacoul
Secretary

Energy Consumption and Supply Situation in Nepal (Year 2011/12)

Water and Energy Commission Secretariat (WECS) has been involved in collection and analysis of the field based energy resources and consumption information since its establishment. Information on energy resources and consumption provide sound bases for appropriate policy formulation and planning of the sector towards sustainable development. It requires regular update and compilation of the resource status through primary research survey and study programs. The information also supports in the integrated resources planning and management.

Energy resources base in the country has usage in multiple dimensions. Fuelwood resources can be used for other wood demanding areas. Similarly agricultural residues and animal dung has vital contribution in agricultural production. Use of water resources also has multiple benefits. Society can also achieve maximum benefits once the resources are utilized at optimum level for the concerned purpose. This requires actual field based information so that benefits can be assessed from multiple perspectives.

Energy Division (ED) of WECS completed Sectoral Energy Supply/Demand Profiles at the regional level and Residential Energy Supply/Demand Profiles at the district level from 1990-1995. Such regional and district level sectoral energy supply demand profiles were updated and compiled in 1995/96 at national level. Industrial Sector Energy Consumption Survey was completed in 1997/98 covering both traditional and modern sector. Furthermore, WECS conducted the Commercial Sector Energy Consumption Survey in 1998/99 and Transport Sector Energy Consumption in the year 1999/2000. Agricultural Sector Energy consumption survey was also completed in 2000/01. Based on these primary surveys of energy demand supply situation, WECS published Energy Sector synopsis report in regular basis. Energy Sector synopsis report 2010 is the latest one in the series.

WECS routinely conducts such primary surveys and prepares reports related to the development of the energy sector in Nepal, for example, estimation of resource potential, energy consumption and conversion technologies appropriate for Nepal's future economic growth, modernization, socio-economic development, policy researches and demonstration studies. Such information surveys and studies provide basic information for conducting various energy policy analysis and energy modeling exercises. Database building and policy analysis work by nature, are ongoing processes.

WECS has completed the National Survey of Energy Consumption and Supply situation of Nepal in the year 2011/12 with a view to determining the present pattern of energy consumption in all economic sectors namely the residential/domestic sector, industrial sector, transport sector, commercial/business sector, agricultural sector and others by physiographic and development regions. The Survey has also collected the secondary data to reflect the supply situation and potential of energy resources in the country.

Energy Supply Situation Biomass Resources

Sources	Total Quantity	
	In Million Tons	In Million GJ
Fuelwood production	12.9	216.075
Woodfuel production from fruit trees	0.184	3.08
Production potential of agriculture residues	23	288.88
Production potential of dry dung	15.7	170.97

Hydro Power Plants

Hydro Power	Capacity (in MW)
Small, Medium & Large scale hydropower	762.03
Mini-hydro	15.95
Micro-hydro	18.65
Pico-hydro	3.18

Hydro Power Generation & Distribution

	Total
Theoretical hydropower potential	83,290 MW
Technical hydropower potential	45,610 MW
Generating facilities in integrated Nepal power system	718.62 MW
Generating substation capacity in integrated Nepal power system	1,415.1 MVA

Biogas Plants and Solar PV

Technical potential of biogas plant installation	
Numbers	1,023,370
Capacity (in Million cu. m)	1,963.7
Total installation of biogas plants	258,642
Installation of solar PV	7,445,304 Wp

Coal

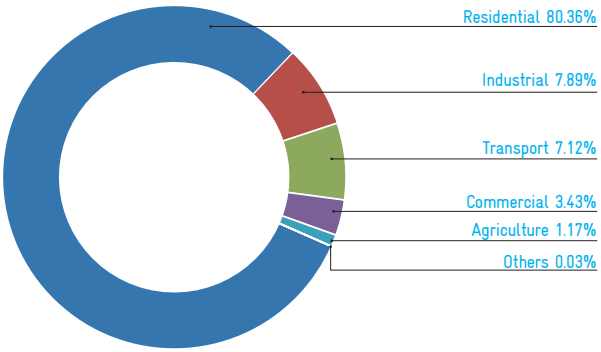
Coal supply (2011/12)	Total (in Tons)
Indigenous production	9,320
Import	580,900

Fuel Sales in 2011/12	Quantity (in kl/MT)
Petrol	199,748.622
Diesel	648,512.95
Kerosene	41,807.94
ATF	109,808.25
LPG	181,411.401
FO	434.63
Petroleum storage capacity	71,742.3

Energy Consumption by Economic Sector

Sectors	Amount (in million GJ)	Percentage
Residential	302.4	80.36%
Industrial	29.7	7.89%
Transport	26.8	7.12%
Commercial	12.9	3.43%
Agriculture	4.4	1.17%
Others	0.1	0.03%
Total Consumption	376.3	100%

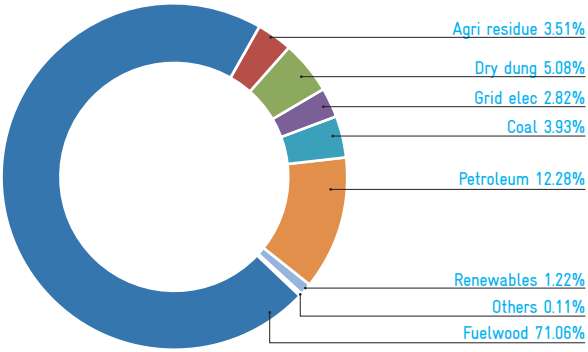
ENERGY CONSUMPTION BY ECONOMIC SECTORS



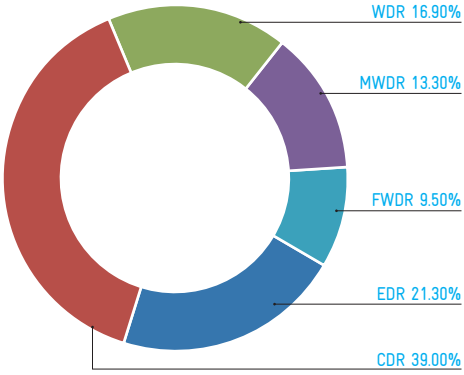
Energy Consumption by Fuel Type

Fuel class	Fueltypes	million GJ	Percentage	GJ/Per capita
Traditional	Fuelwood	267.4	71.1%	10.1
	Agri residue	13.2	3.5%	0.5
	Dry dung	19.1	5.1%	0.7
Commercial	Grid elec	10.6	2.8%	0.4
	Coal	14.8	3.9%	0.6
	Petroleum	46.2	12.3%	1.7
Alternative	Renewables	4.6	1.2%	0.2
Others	Others	0.4	0.1%	0
	Total	376.3	100%	14.2

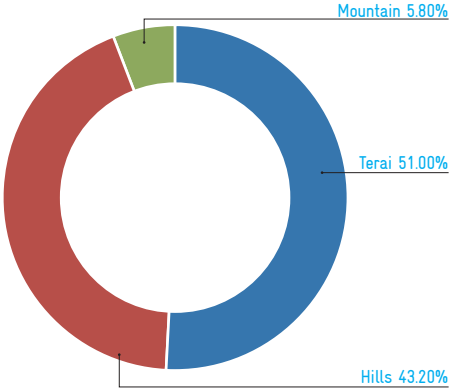
ENERGY CONSUMPTION BY FUEL TYPE



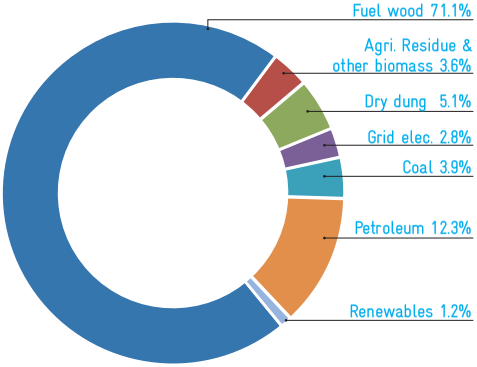
ENERGY CONSUMPTION BY DEVELOPMENT REGIONS



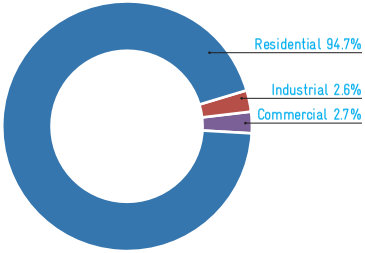
ENERGY CONSUMPTION BY PHYSIOLOGICAL REGIONS



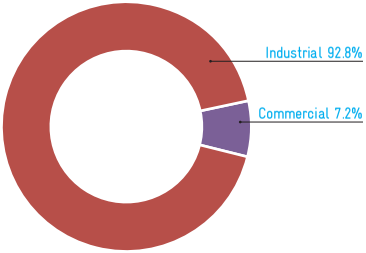
ENERGY COMSUMPTION BY FUEL TYPE AND SECTOR



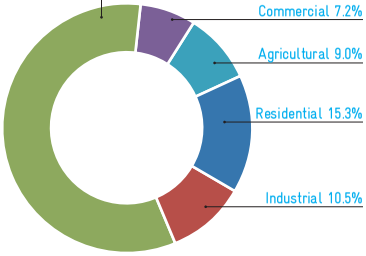
FUELWOOD



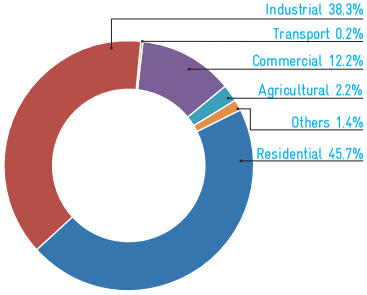
COAL



PETROLEUM

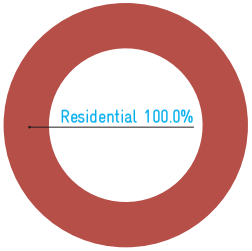


GRID ELECTRICITY



DRY DUNG

AGRI. RESIDUE

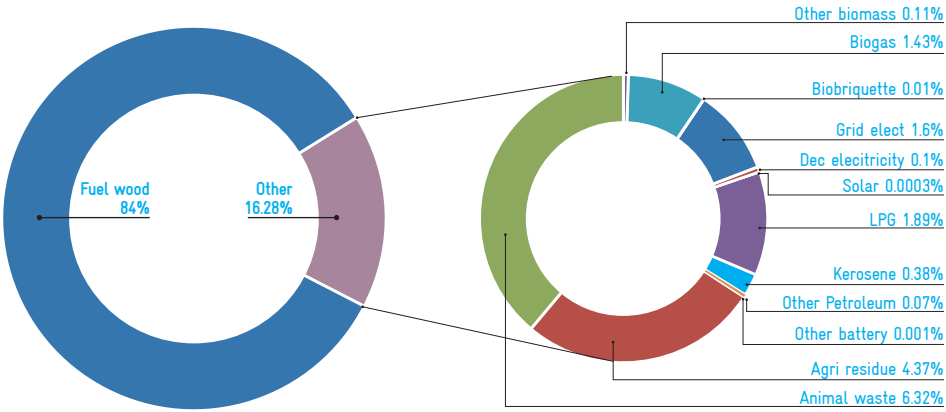


RENEWABLES

Energy Consumption pattern in the Residential Sector

Fueltype	Use ('000 GJ)								
	Cooking	Heating	Cooling	Lighting	Water boiling	Water pumping	Electric appliances	Other uses	Grand Total
Fuelwood	143,709.8	40,594.3	0.0	0.0	37,955.0	0.0	0.0	30,903.2	253,162.2
Agri residue	13,225.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13,225.7
Animal waste	16,671.3	1,893.0	0.0	0.0	0.0	0.0	0.0	547.6	19,112.0
Other biomass	77.1	177.3	0.0	0.0	0.0	0.0	0.0	84.7	339.1
Biogas	4,178.0	0.0	0.0	150.1	0.0	0.0	0.0	0.0	4,328.1
Biobriquette	0.5	33.3	0.0	0.0	1.9	0.0	0.0	0.0	35.7
Charcoal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grid electricity	878.5	174.2	609.4	1,159.3	326.5	363.6	1,114.9	197.4	4,823.7
Dec electricity	0.0	0.0	0.0	231.4	0.0	1.4	58.2	1.8	292.8
Solar	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.9
Wind	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LPG	5,120.9	0.0	0.0	0.0	566.6	0.0	0.0	13.5	5,701.0
Kerosene	456.8	0.0	0.0	575.6	74.5	0.0	0.0	43.5	1,150.4
Other petroleum	0.0	0.0	0.0	199.2	0.0	0.0	0.0	12.4	211.6
Others: battery	0.0	0.0	0.0	1.3	0.0	0.0	0.4	0.0	1.7
	184,318.5	42,872.1	609.4	2,317.7	38,924.5	364.9	1,173.6	31,804.1	302,384.9

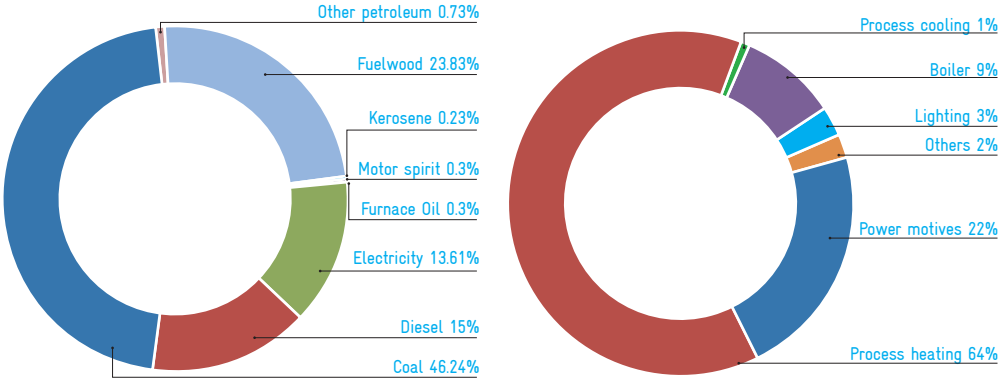
ENERGY CONSUMPTION PATTERN IN THE RESIDENTIAL SECTOR



Energy Consumption pattern in the Industrial Sector ('000 GJ)

Fuel types	Uses						Grand Total
	Power motives	Process heating	Process cooling	Boiler	Lighting	Others	
Coal	0.00	12,417.22	0.00	1,335.70	0.00	0.00	13,752.92
Diesel	3,644.80	0.00	0.00	17.90	550.92	248.46	4,462.09
Electricity	2,779.41	432.13	282.28	228.08	232.38	91.89	4,046.16
Motor spirit	68.88	0.00	0.00	0.91	14.76	4.86	89.41
Kerosene	0.00	68.45	0.00	0.00	0.00	0.00	68.45
Fuel Oil	0.00	12.17	0.00	5.79	0.00	0.00	17.96
Fuelwood	0.00	5,985.45	0.00	1,027.68	0.00	73.36	7,086.49
Other petroleum	0.00	0.00	0.00	0.00	137.82	78.49	216.32
Grand Total	6,493.08	18,915.41	282.28	2,616.06	935.89	497.06	29,739.78

ENERGY CONSUMPTION IN THE INDUSTRIAL SECTOR BY END USE AND BY FUEL TYPE



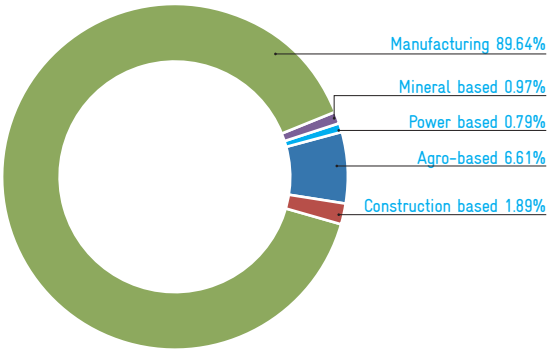
Nepal Energy Information System

Additional data and information about energy situation in Nepal can be accessed through web portal of Nepal Energy Information System (NEIS) (at www.neis.gov.np). NEIS is envisaged as an important element of a comprehensive energy database and management system that will support in managing and making energy related data easily accessible for analysis and decision making in energy related initiatives. Establishment of NEIS is supported by Nepal Energy Efficiency Programme (NEEP), a Nepali – German programme executed by WECS and supported by German Development Cooperation – GIZ on behalf of Federal Ministry of Economic Cooperation and Development (BMZ).

Energy Consumption Pattern in Industrial Sector by Industry types ('000 GJ)

Fueltypes	Industry types					Grand Total
	Agro-based	Construction based	Manufacturing	Mineral based	Power based	
Coal	0.00	0.00	13,752.92	0.00	0.00	13,752.92
Diesel	533.33	340.68	3,356.36	197.99	33.72	4,462.09
Electricity	273.03	106.44	3,435.80	29.14	201.74	4,046.16
Motor spirit	10.72	3.26	74.84	0.00	0.58	89.41
Kerosene	0.00	0.00	68.45	0.00	0.00	68.45
Fuel Oil	0.00	0.00	17.96	0.00	0.00	17.96
Fuelwood	1,120.60	125.48	5,840.41	0.00	0.00	7,086.49
Other petroleum	27.72	13.12	113.30	62.17	0.00	216.32
Grand Total	1,965.40	588.99	26,660.04	289.30	236.05	29,739.78

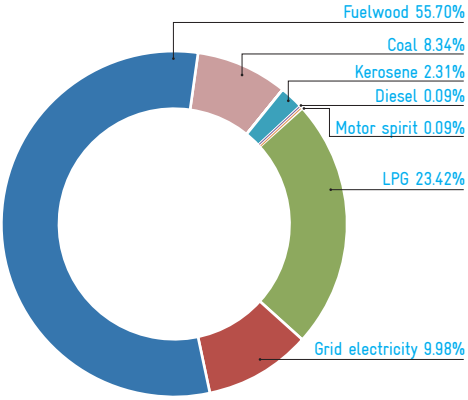
ENERGY CONSUMPTION PATTERN IN THE INDUSTRIAL SECTOR BY INDUSTRY TYPE



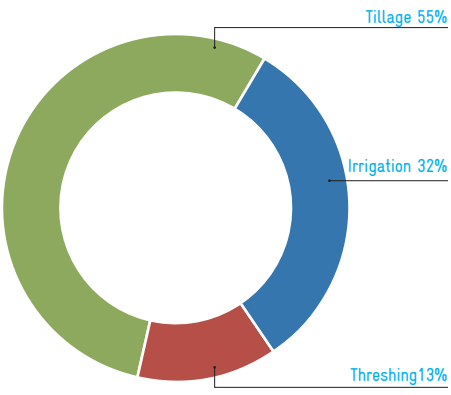
Energy consumption in commercial sector ('000 GJ)

Fuel types	Total	Percent
Fuelwood	7,166.73	55.70%
Grid electricity	1,283.94	9.98%
LPG	3,013.56	23.42%
Diesel	12.17	0.09%
Kerosene	297.27	2.31%
Motor spirit	11.65	0.09%
Other petroleum	7.37	0.06%
Coal	1,073.43	8.34%
Grand Total	12,866.11	100%

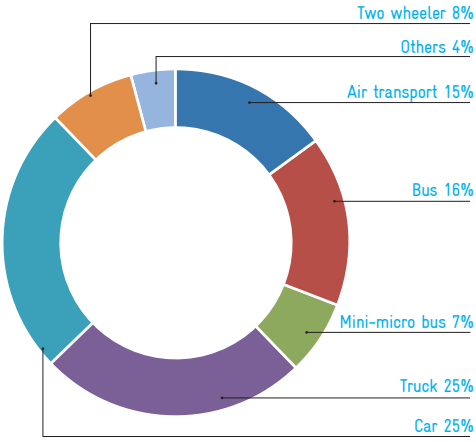
ENERGY CONSUMPTION IN THE COMMERCIAL SECTOR BY FUEL TYPE



ENERGY CONSUMPTION IN THE AGRICULTURE SECTOR BY END-USE



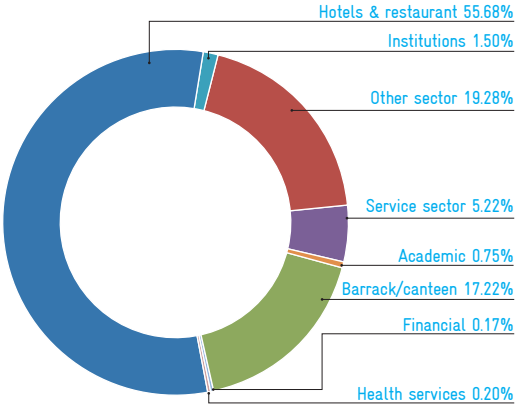
ENERGY CONSUMPTION IN THE TRANSPORT SECTOR BY VEHICLE TYPE



Energy Consumption in Commercial Sub-Sectors ('000 GJ)

Sub sector	G. Total	Percent
Academic	96.00	0.75%
Barrack/canteen	2,215.42	17.22%
Financial	21.38	0.17%
Health services	25.15	0.20%
Hotels & restaurant	7,163.29	55.68%
Institutions	193.25	1.50%
Other sector	2,480.52	19.28%
Service sector	671.09	5.22%
Grand Total	12,866.11	100%

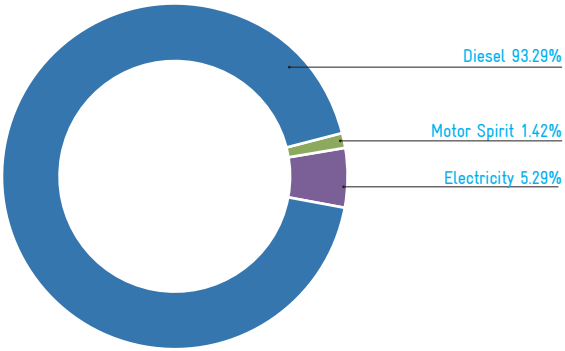
TOTAL ENERGY CONSUMPTION IN AGRICULTURE SECTOR (000 GJ)



Energy Consumption in the Agriculture Sector by Fuel Type ('000 GJ)

Energy classification / Fuel	Energy use			Grand Total	Percentage
	Irrigation	Threshing	Tillage		
Diesel	1,146.37	537.62	2,418.97	4,102.96	93.29%
Motor spirit	58.77	3.86		62.63	1.42%
Electricity	214.63	17.86		232.49	5.29%
Grand Total	1,419.77	559.33	2,418.97	4,398.07	100%

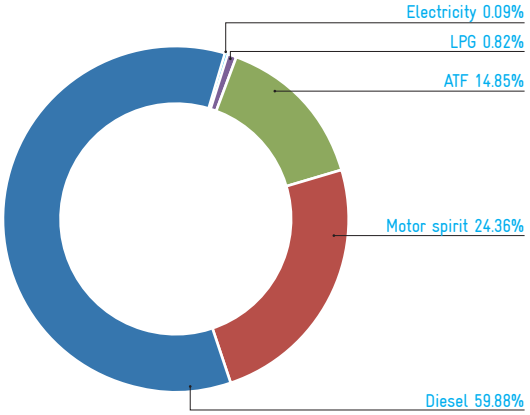
ENERGY CONSUMPTION IN THE AGRICULTURE SECTOR BY FUEL TYPE



Energy Consumption in Transport Sector ('000 GJ)

Transport Type	Fuel						
	Diesel	Motor spirit	ATF	LPG	Electricity	Grand Total	Percent
Bus	4,272.73					4,272.73	15.97%
Minibus_microbus	1,988.17					1,988.17	7.43%
Car_jeep_van_pickup	2,305.38	4,373.63				6,679.01	24.97%
Truck_tanker_lorry	6,671.03					6,671.03	24.94%
Three wheeler	222.69			219.79		442.47	1.65%
Tractor_others	463.00					463.00	1.73%
Two wheeler		2,143.48				2,143.48	8.01%
Rails	97.73					97.73	0.37%
Cable car					23.36	23.36	0.09%
Domestic flight			973.27			973.27	3.64%
International flight			2,998.49			2,998.49	11.21%
Grand Total	16,020.72	6,517.11	3,971.76	219.79	23.36	26,752.73	100%
Percent	59.88%	24.36%	14.85%	0.82%	0.09%	100%	

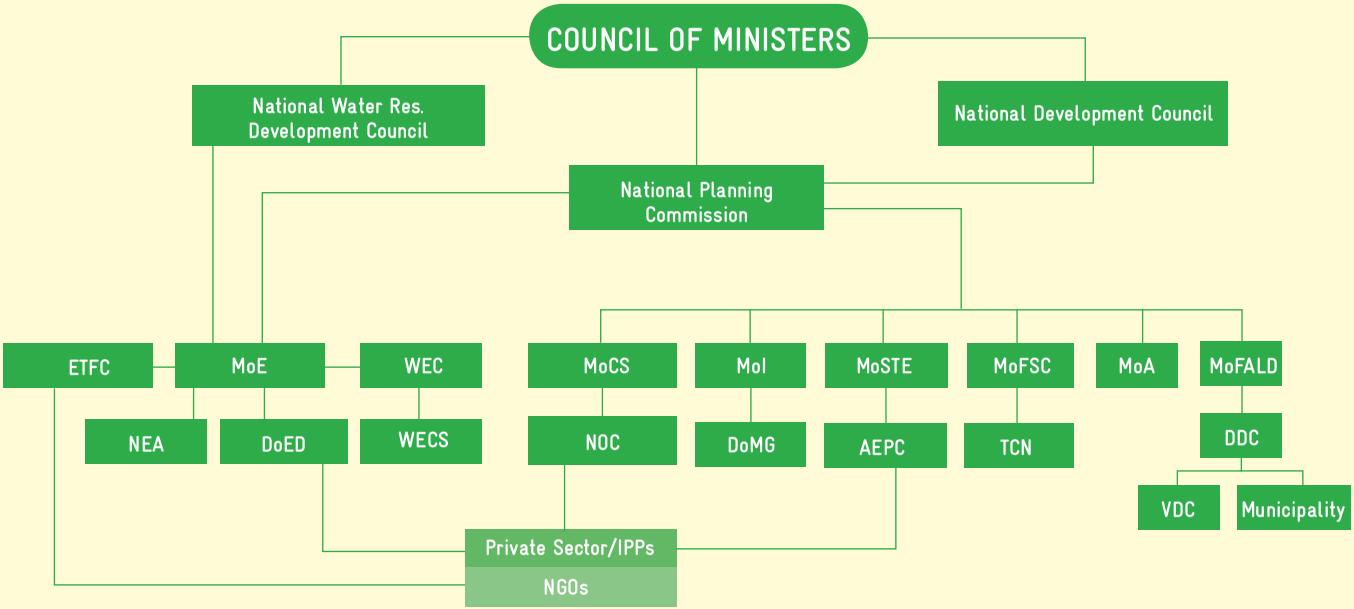
ENERGY CONSUMPTION IN THE TRANSPORT SECTOR BY FUEL TYPE



Basic Energy Conversion

Units	kcal ('000)	GJ	tce	toe
kcal ('000)	1	0.004187	0.000143	9.72E-05
GJ	238.8459	1	0.034121	0.023462
tce	7,000	29.3076	1	0.068762
toe	10,290	42.6217	1.454288	1
MWh	860	3.6	0.12	0.08

ORGANIZATIONS IN ENERGY SECTOR



About WECS

The Water and Energy Commission (WEC) was established by GoN in 1975 with the objective of developing the water and energy resources in an integrated and accelerated manner. Consequently, a permanent secretariat of WEC was established in 1981 and was given the name, Water and Energy Commission Secretariat (WECS). The primary responsibility of WECS is to assist GoN, different ministries relating to Water Resources and other related agencies in the formulation of policies and planning of projects in the water and energy resources sector. The objectives and mandates of WEC and WECS have been revised and modified a number of times since their establishment.

Composition of Water and Energy Commission (WEC)

The composition of the commission is as follows:

Chairman : Minister for Energy

Member : Member, National Planning Commission (Water Resources)
Secretaries of Various Eleven Ministries of GoN
Two persons nominated by the Government from well known water resources and energy specialist
Dean, Institute of Engineering, Tribhuvan University
President, Nepal Engineers' Association
Representative, Federation of Nepalese Chamber of Commerce and industry

Member Secretary : Secretary, WECS

GoN may necessarily add or deduct and reshuffle the number of members of the Commission as and when deemed necessary. The tenure of the nominated members is two years. The Commission may also invites in its meeting experts or officials as and when deemed necessary.

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