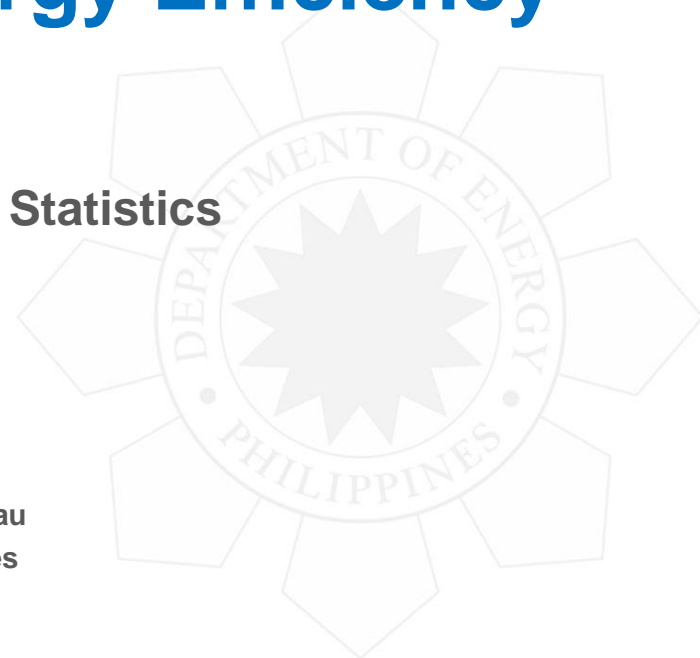




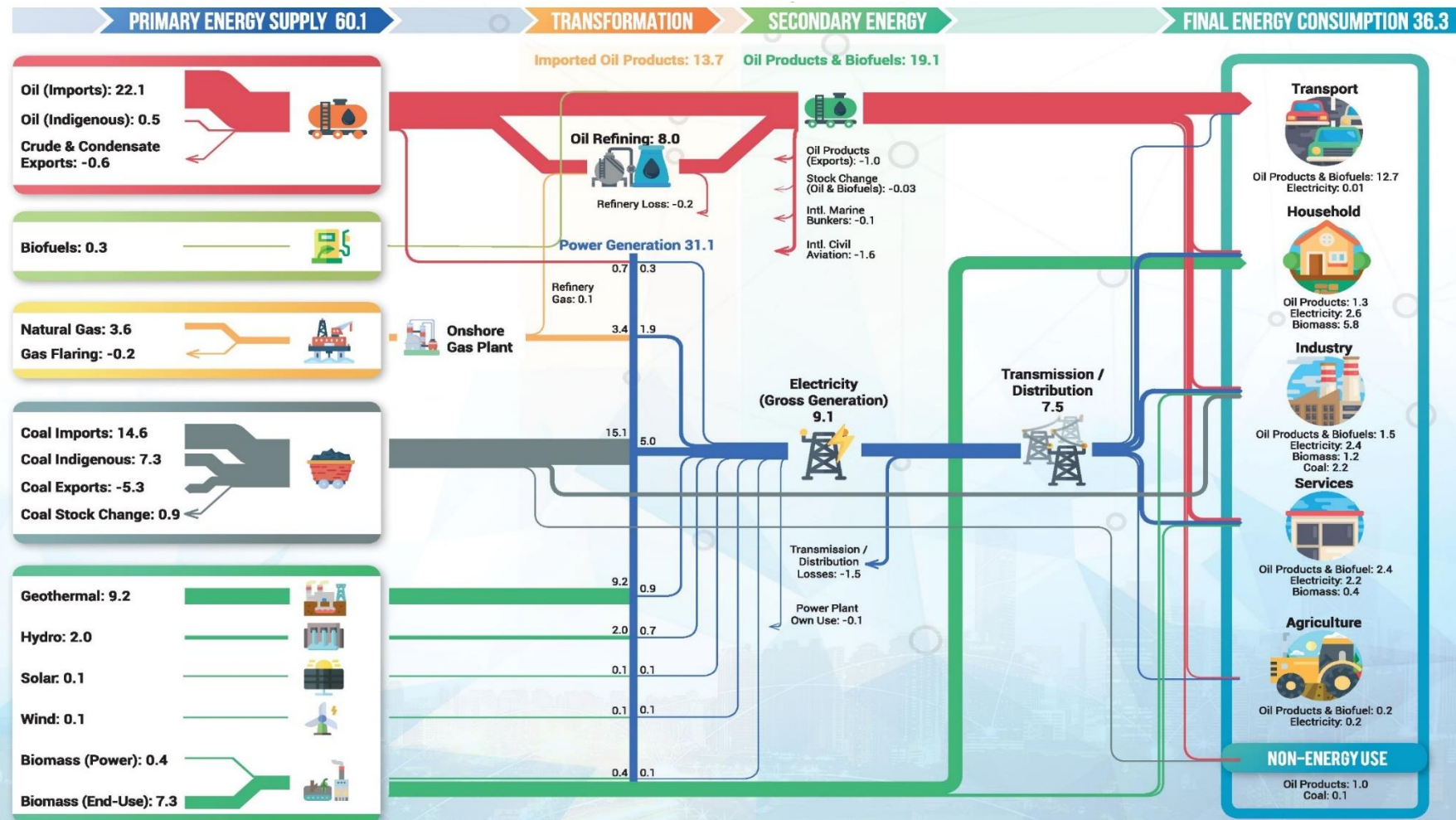
# Collection/Estimation of Energy and Activity Indicators for Energy Efficiency

19<sup>th</sup> APEC Workshop on Energy Statistics  
June 28-29, 2021

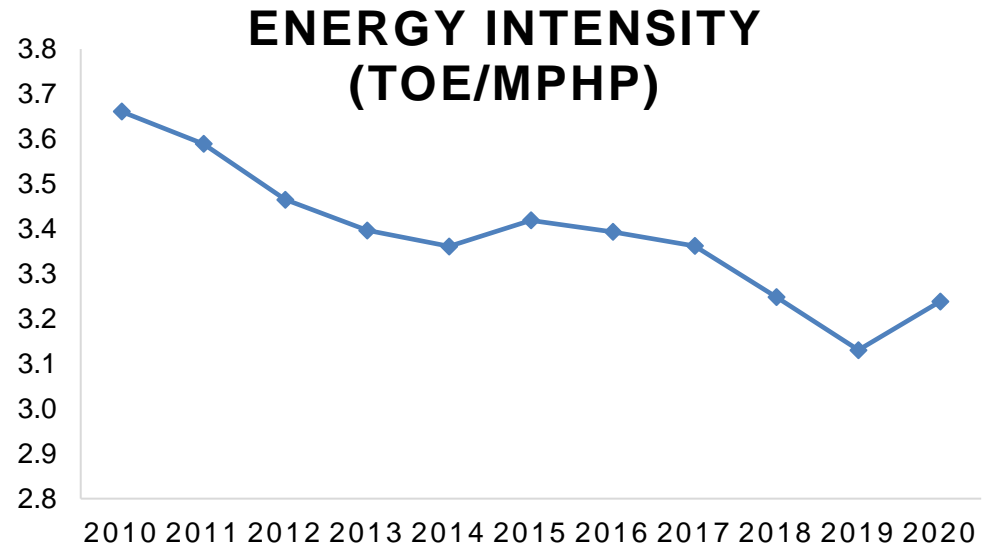
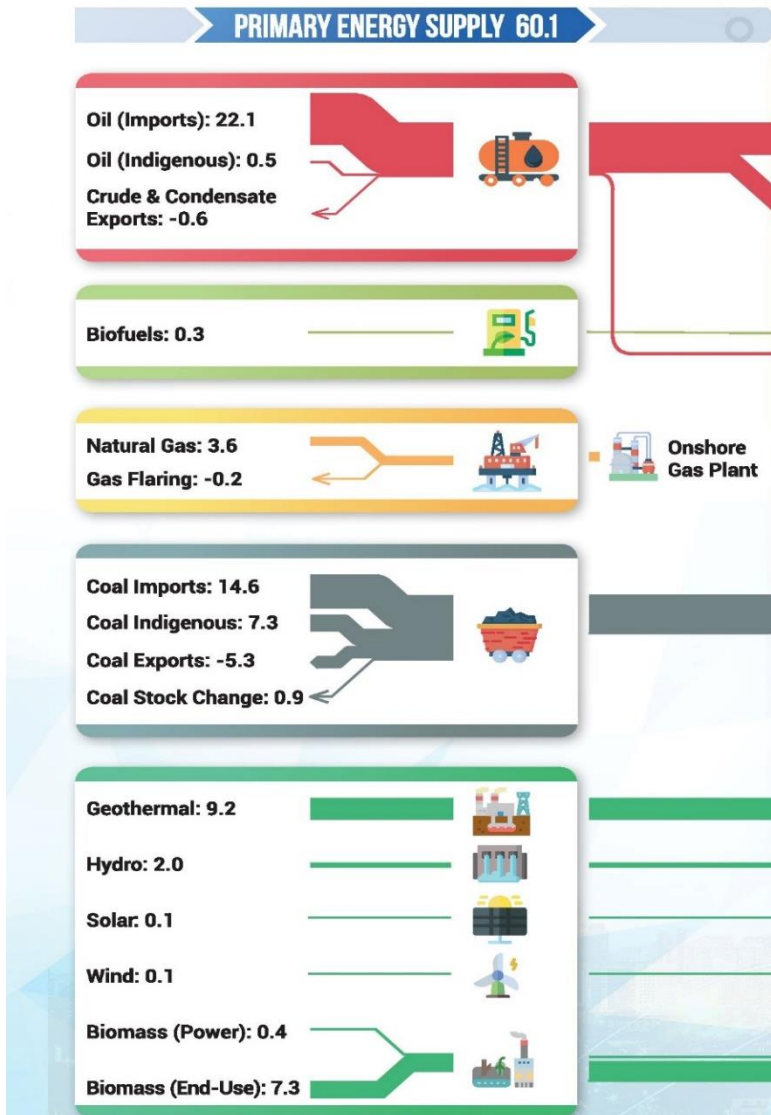
Director Jesus T. Tamang  
Energy Policy and Planning Bureau  
Department of Energy, Philippines



# 2019 Reference Energy System, in MTOE



# Energy Indicators in Supply Sectors



## Other indicators to establish and monitor

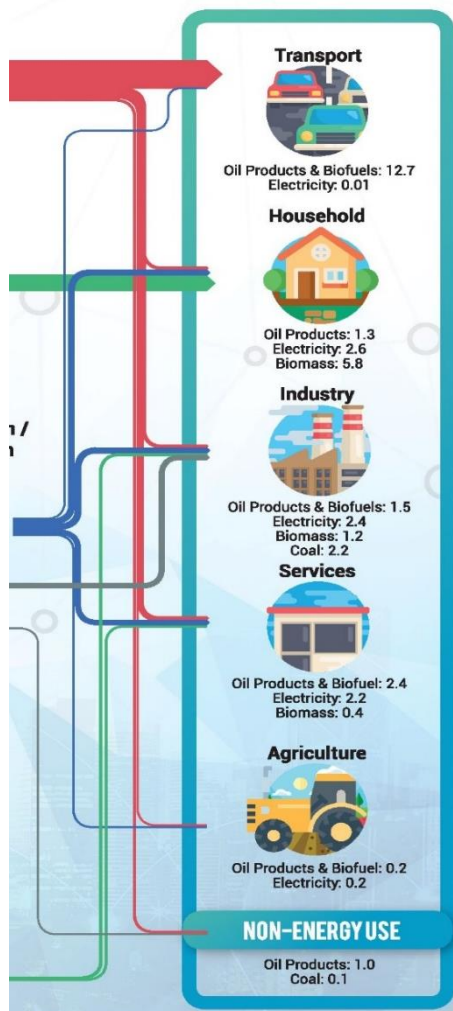
How much energy is consumed

- To produce a unit of each Primary Energy?
- To process and store each Primary Energy?
- To transport/deliver each unit of Primary Energy?



# Energy Indicators in Demand Sectors

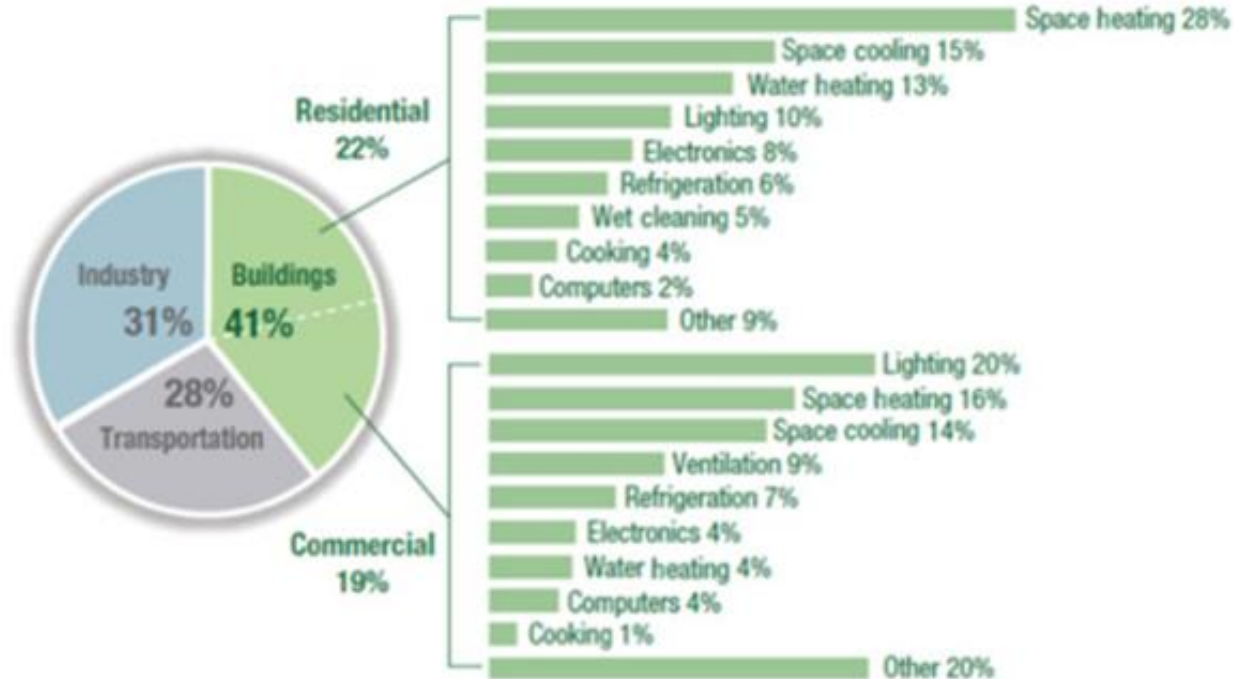
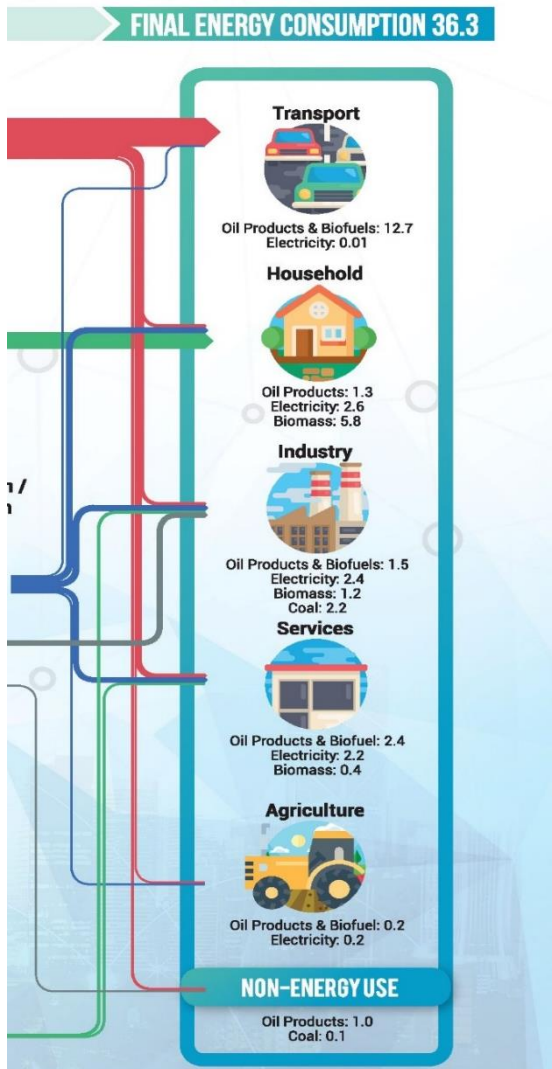
## FINAL ENERGY CONSUMPTION 36.3



YEAR	ENERGY INTENSITY (TOE/MPhp)			
	Industry	Services	Households	Agriculture
2010	1.84	1.69	0.23	0.96
2011	1.81	1.61	0.19	0.92
2012	1.66	1.57	0.20	0.88
2013	1.72	1.54	0.21	0.86
2014	1.69	1.53	0.21	0.82
2015	1.76	1.58	0.24	0.79
2016	1.80	1.60	0.27	0.76
2017	1.83	1.59	0.30	0.73
2018	1.60	1.55	0.25	0.71
2019	1.43	1.51	0.27	0.69
2020	1.46	1.36	0.25	0.78



# Energy Indicators in Buildings and Services



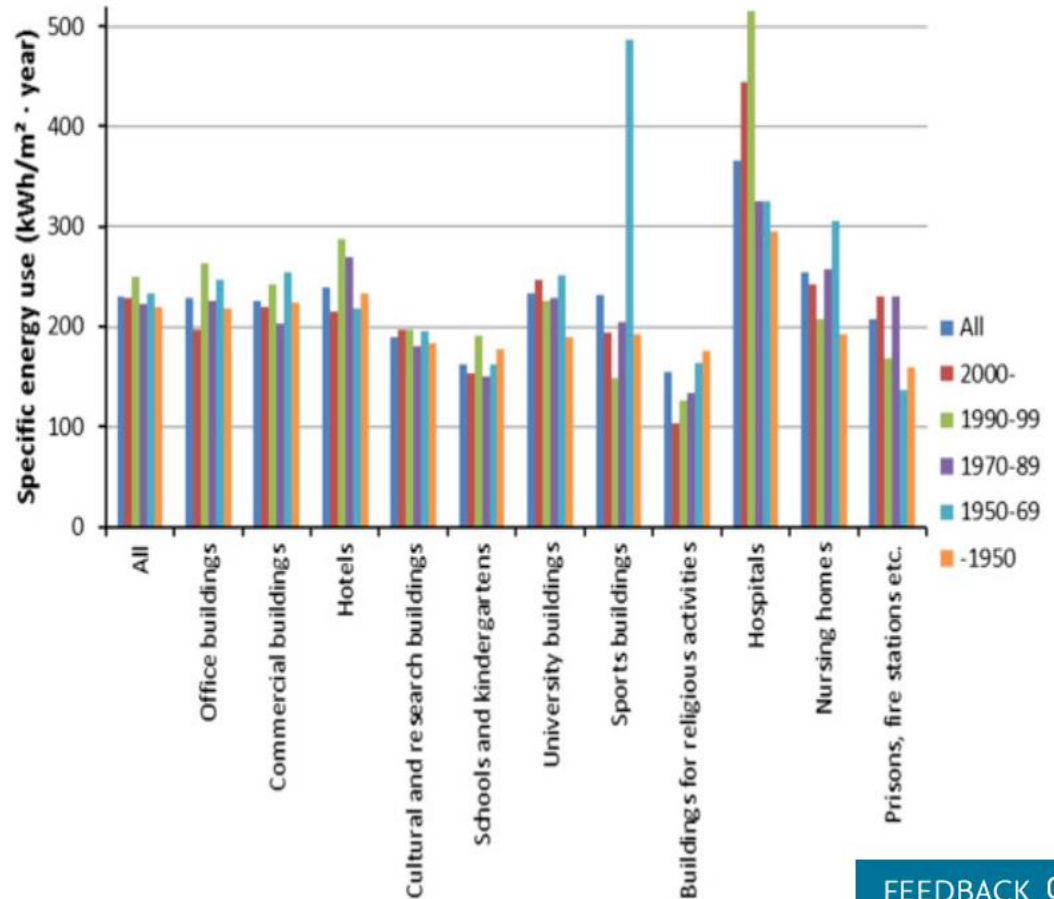
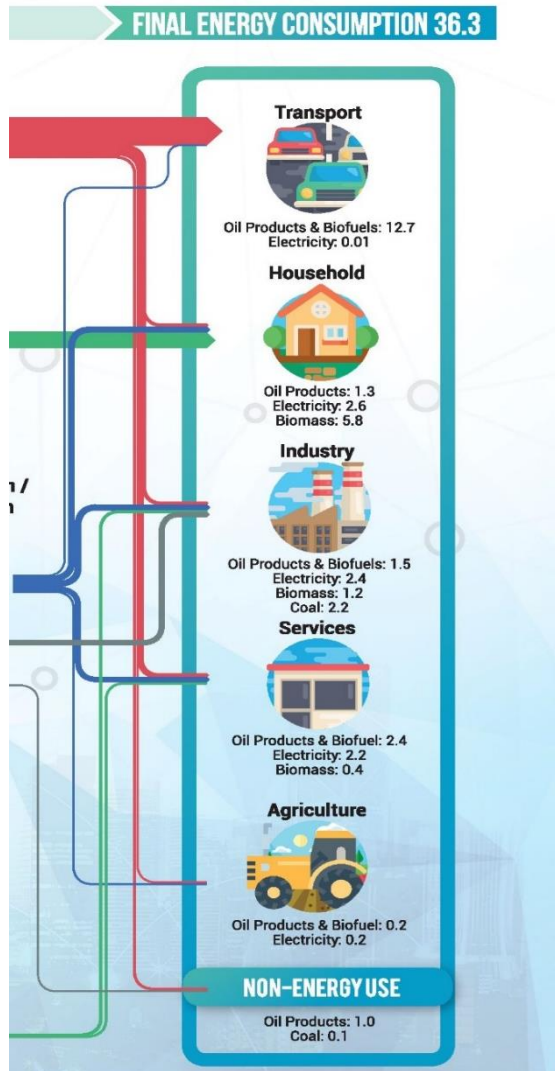
What is the breakdown of energy use in buildings?

What is the energy use per type of building?

How to handle multiple-use buildings?



# Energy Indicators in Buildings and Services



FEEDBACK



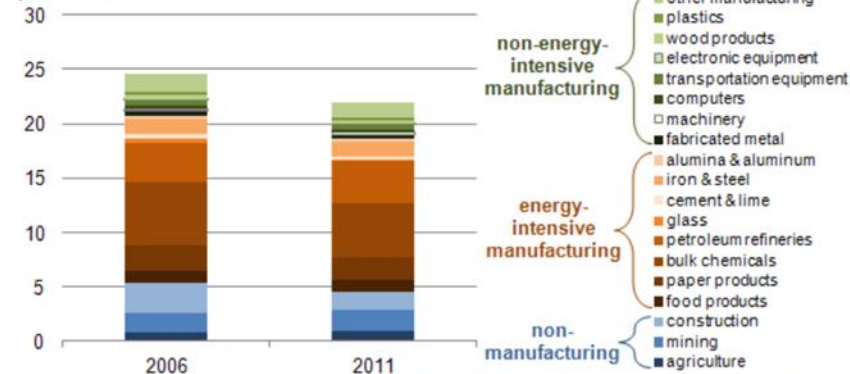
# Energy Indicators in Industry

	Coal	Natural Gas	Condensate	Crude	Gasoline	Kerosene	Diesel	Fuel Oil	LPG	Jet A-1	Avgas	Naphtha	Asphalt	OtherPP	Hydro	Geothermal	Solar	Wind	Biomass	Biodiesel	Bioethanol	Electricity	Total	
Indigenous	6,204	3,601	424	170	-	-	-	-	-	-	-	-	-	-	2,336	8,973	107	99	7,668	168	170	-	29,920	
Imports (+)	13,882	-	-	11,513	2,366	34	5,224	757	1,404	1,180	4	1,019	187	32	-	-	-	-	-	-	145	-	37,747	
Exports (-)	2,668	-	424	143	247	-	120	248	1	-	-	208	47	766	-	-	-	-	-	-	-	-	4,872	
International Marine Bunkers	-	-	-	-	-	-	19	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	83	
International Civil Aviation	-	-	-	-	-	-	-	-	-	1,625	-	-	-	-	-	-	-	-	-	-	-	-	1,625	
Stock Change (+/-)	1,069	-	-	10	182	2	178	2	10	38	0	7	1	1	-	-	-	-	-	-	14	35	1,427	
Total Primary Energy Supp	16,349	3,601	-	11,529	1,937	32	4,907	447	1,393	482	4	819	140	733	2,336	8,973	107	99	7,668	182	350	-	59,660	
Refinery (Crude Run)	-	-	-	11,553	2,593	46	4,469	705	546	1,026	-	261	-	1,274	-	-	-	-	-	-	-	-	632	
Power Generation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Fuel Input (-)	13,776	3,324	-	-	-	-	373	355	-	-	-	-	-	-	2,336	8,973	107	99	373	8	-	-	29,725	
Electricity Generation	4,465	1,834	-	-	-	-	260	13	-	-	-	-	-	-	807	897	107	99	95	-	-	8,578	8,578	
Transmission/Dist. Loss (-)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	774	774	
Energy Sector Use & Loss (-)	-	218	-	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	700	998	
Net Domestic Supply	2,573	59	-	104	4,530	78	9,003	797	1,939	544	4	1,080	140	541	-	-	-	-	7,295	174	350	7,104	36,109	
Statistical Difference	-	0	-	-	19	3	90	132	51	34	1	61	10	450	-	-	-	-	-	-	-	0	386	
% Statistical Difference	-	0	-	-	70	4	1	17	3	6	16	6	7	83	-	-	-	-	-	-	-	0	1	
Total Final Energy Consum	2,573	59	-	-	4,511	81	8,913	929	1,889	579	5	1,019	151	91	-	-	-	-	7,295	174	350	7,104	35,723	
Industry	2,411	59	-	-	-	2	693	578	196	-	-	-	-	-	-	-	-	-	1,199	13	-	2,372	7,523	
Manufacturing	2,411	59	-	-	-	2	312	535	177	-	-	-	-	-	-	-	-	-	1,199	6	-	2,276	6,976	
Mining	-	-	-	-	-	0	177	39	-	-	-	-	-	-	-	-	-	-	-	-	3	-	74	293
Construction	-	-	-	-	-	0	204	4	19	-	-	-	-	-	-	-	-	-	-	-	4	-	22	254
Transport	-	-	-	-	4,504	-	6,452	203	10	579	5	-	-	-	-	-	-	-	-	-	127	350	9	12,238
Railway	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	9	11
Road	-	-	-	-	4,337	-	5,943	-	10	-	-	-	-	-	-	-	-	-	-	-	121	350	-	10,761
Water	-	-	-	-	167	-	508	203	-	-	-	-	-	-	-	-	-	-	-	-	6	-	-	883
Air	-	-	-	-	-	-	-	-	-	579	5	-	-	-	-	-	-	-	-	-	-	-	-	584
Residential	-	-	-	-	-	79	-	-	1,176	-	-	-	-	-	-	-	-	-	5,746	-	-	2,430	9,431	
Commercial	-	-	-	-	-	-	1,568	148	507	-	-	-	-	-	-	-	-	-	350	30	-	2,065	4,668	
Agriculture, Fishery and Fo	-	-	-	-	7	0	200	1	-	-	-	-	-	-	-	-	-	-	-	-	4	-	228	440
Agri-Industry	-	-	-	-	2	0	36	0	-	-	-	-	-	-	-	-	-	-	-	-	1	-	200	239
Forestry	-	-	-	-	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	1	1
Fishery	-	-	-	-	5	0	163	0	-	-	-	-	-	-	-	-	-	-	-	-	3	-	27	199
NON-ENERGY USE	162	-	-	-	-	-	-	-	-	-	-	1,019	151	91	-	-	-	-	-	-	-	-	1,423	
Self-sufficiency																							50.15	



# Energy Indicators in Industry

U.S. industrial consumption of delivered energy, 2006 and 2011  
quadrillion Btu



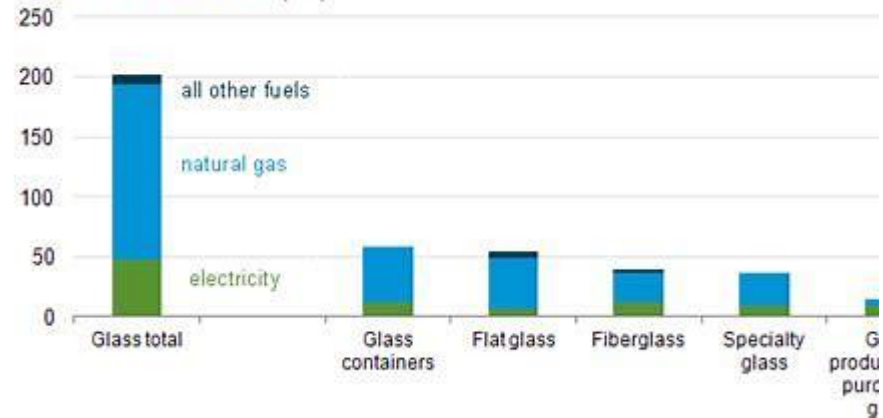
Source: U.S. Energy Information Administration, *Annual Energy Outlook 2012*, derived from *Manufacturing Energy Consumption Survey 2006*.

Source corrected from information in the September 25 post.

- Industries have different levels of energy use.
- Specific energy consumption can be reported in total and per fuel basis.
- Challenges exist in reporting specific energy consumption for industries with multiple products e.g. mining that is able to produce copper, gold, etc.

Product type	Type of fuel used	Specific Energy Consumption (MJ/kg)		
		Min	Average	Max
Wall tiles	Coal gas fired	5.65	6.09	6.51
	Natural Gas fired	4.36	5.06	5.76
Vitrified tiles	Coal gas fired	-	5.0	-
	Natural Gas fired	4.93	5.65	6.36
Floor tiles <sup>1</sup>	Coal gas fired	-	-	-
	Natural Gas fired	-	6.04	-
Sanitary ware	Coal gas fired	-	-	-
	Natural Gas fired	4.5	4.7	4.8

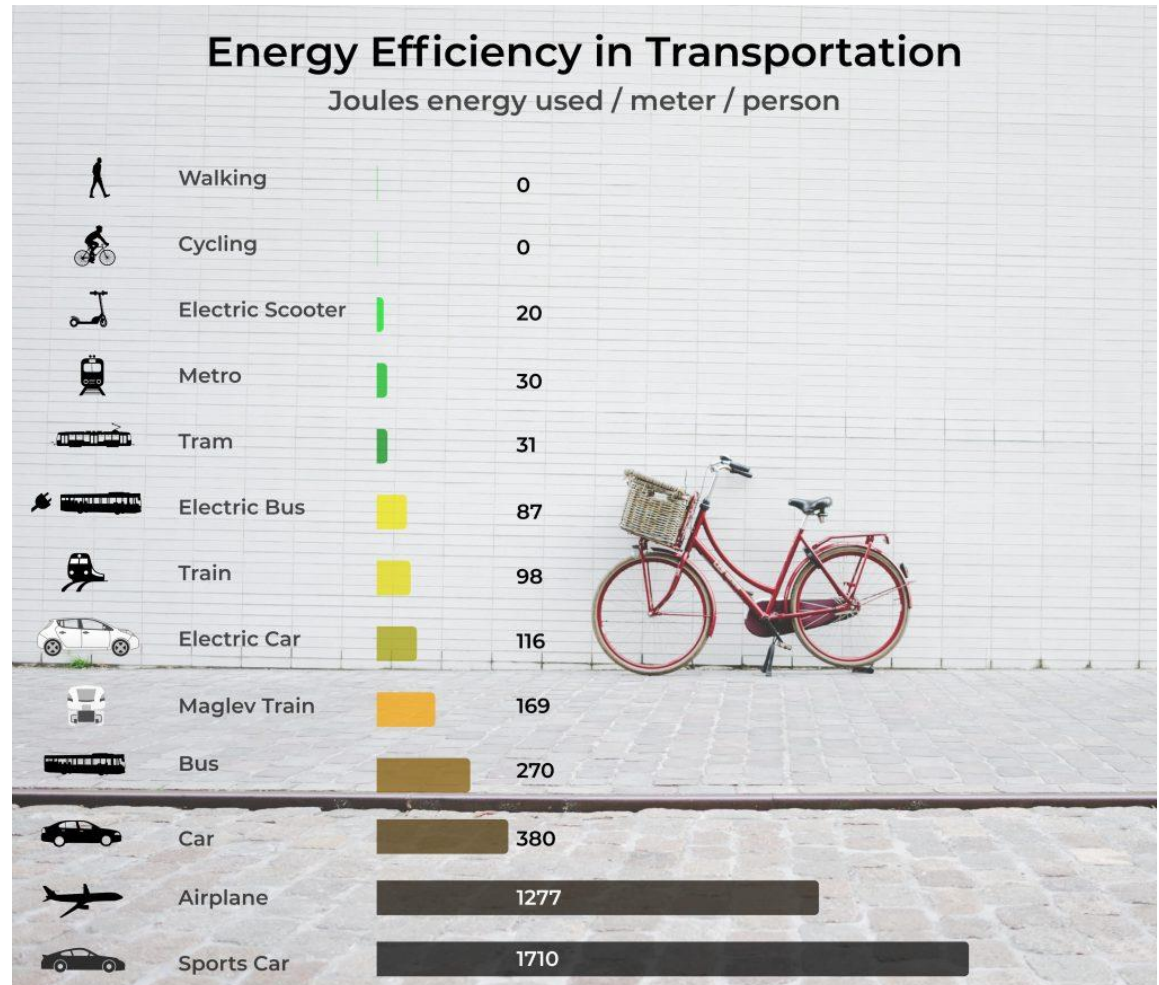
Energy consumption in glass manufacturing by fuel  
trillion British thermal units (Btu)





# Energy Indicators in Transport

Energy in all modes of transport is not just to move people but also to deliver goods and services



For full list of references please visit [EcoHungry.com/energy-efficiency-in-transportation](https://EcoHungry.com/energy-efficiency-in-transportation)

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[ECOHUNGRY.COM](https://EcoHungry.com)



# Programs & Initiatives on EE&C

## R.A. No. 11285: Energy Efficiency and Conservation Act

What indicators can be used to measure the success of policies and programs ?



### Professional Competency and Services

- Certified Energy Conservation Officer (CECO)
- Certified Energy Manager (CEM)
- Certified Energy Auditor (CEA)
- Energy Service Company (ESCO)



### Designated Establishments

Mainstreaming of energy efficient technologies in energy intensive industries to reduce energy consumption

Engagement of Professional Competency and Services in Designated Establishments



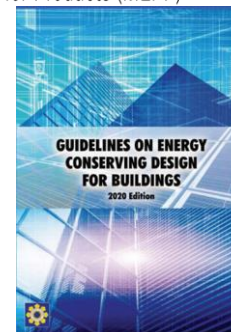
### Government Energy Management Program

- Inter-Agency Energy Efficiency and Conservation Committee (IAEECC)
- Introduction of energy efficient systems for electrical and mechanical equipment
- Government Vehicle Re-fleeting Using Next Generation Vehicles



### Energy Performance Rating

- PESLP
- Minimum Energy Performance for Products (MEPP)



### Demand Side Management

- Effective load management
- Peak to off-peak migration
- Use of Energy Efficiency (EE) technologies and systems



# Programs & Initiatives on EE&C

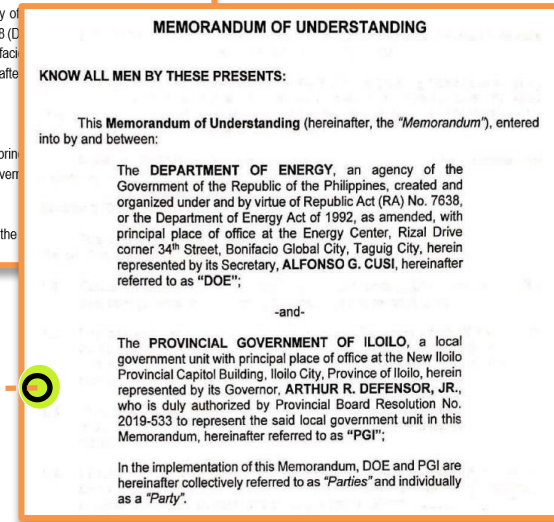
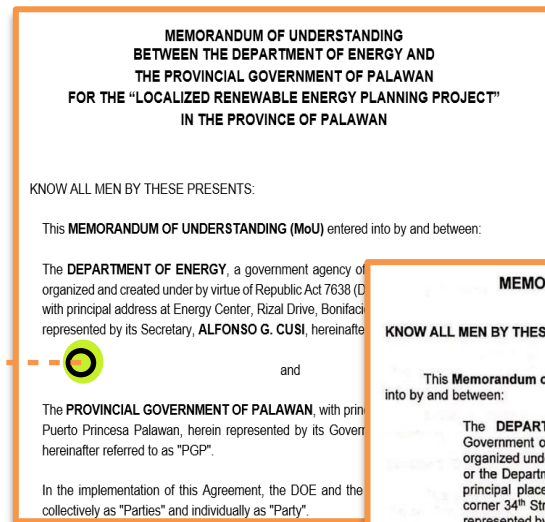
## Promoting Local Energy Planning

### OBJECTIVE:

- Incorporate Energy Policies and Projects in the Local Legislative and Executive Agenda
- Facilitate implementation of Joint memo Circular of DILG-DOE No. 2020-01
- Supports RA 7160 Local Government Code for self-reliance in the delivery of basic services, ranging from agriculture, health, hygiene, education and other social services.



Existing LREP Areas with DOE
Palawan
Iloilo
Lanao del Sur (preparatory stage)



# Programs & Initiatives on EE&C

## Media Campaign for Consumer Participation



### #EPowerMo

disseminates timely information on safety, security and consumer choice



### #EnerhiyangAtin

to increase awareness towards achieving self-sufficiency, sustainable development and resiliency of infrastructures

**E - SAFETY MO**

**E - SECURE MO**

**E - DISKARTE MO**



### #EnergyAbility

to make EE and the utilization of RE and other advance technologies **a way of life for Filipinos**



# Challenges in EE&C



- Conduct of Periodic Sectoral Surveys



- Conduct of Energy Audits



- Identification of Appropriate Energy Indicators





# Collection/Estimation of Energy and Activity Indicators for Energy Efficiency

19<sup>th</sup> APEC Workshop on Energy Statistics  
June 28-29, 2021

Director Jesus T. Tamang  
Energy Policy and Planning Bureau  
Department of Energy, Philippines

