TGP-EEDP
Thai - German Programme on Energy Efficiency Development Plan

Introduction
Energy Efficiency Indicators (EEI)

EE Focus Group Meeting

Ministry of Energy

Monthon Kumpaengseth

8 July 2015

Energy Policy and Planning Office
MINISTRY OF ENERGY

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

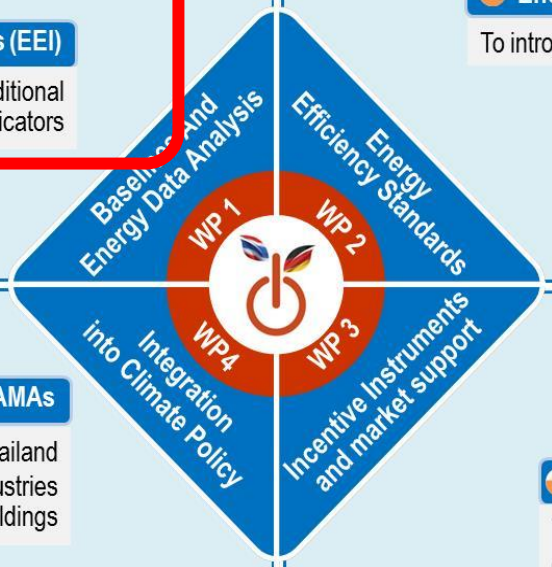
Content

- ✓ Introduction and overview energy and economic data
- ✓ EEI database
- ✓ EEI for industrial sector
- ✓ EEI for services sector

1

Energy Efficiency Indicators (EEI)

To review data and develop additional energy efficiency indicators



2

Energy Efficiency Resource Standards (EERS)

To introduce and review EERS for utilities

Building Energy Code (BEC)

To support in developing a timeline of gradually tightening of BEC

Standard Offer Programme (SOP)

- To introduce international experiences on SOP
- To support SOP pilot project

ESCO

To review ESCO business and provide trainings for further development/improvement

3

Building Energy Code (BEC)

Develop a financial tool for higher performance BEC to support the uptake of BEC is developed.

Specific Energy Consumption (SEC) Benchmarking

To contribute to a scheme of Specific Energy Consumption (SEC) benchmarking

4

Energy Efficiency NAMAs

To support NAMA development in Thailand will focus on energy efficiency in industries and commercial buildings

Remark

- Not yet started
- Quarter done
- Half done
- Three quarter done
- Task done

TGP-EEDP Overview

Introduction and overview of energy and economic data

Objectives of the study

เพื่อพัฒนาต่อยอดการจัดทำดัชนีประสิทธิภาพการใช้พลังงาน (Energy Efficiency Indicator-EEI) สำหรับภาคอุตสาหกรรม และภาคอาคารธุรกิจ เช่น ดัชนีประสิทธิภาพการใช้พลังงานในสาขาอุตสาหกรรมสาขาย่อย เป็นต้น เพื่อใช้เป็น ข้อมูลฐาน (Baselines) ในการดำเนินงานด้านอนุรักษ์พลังงาน

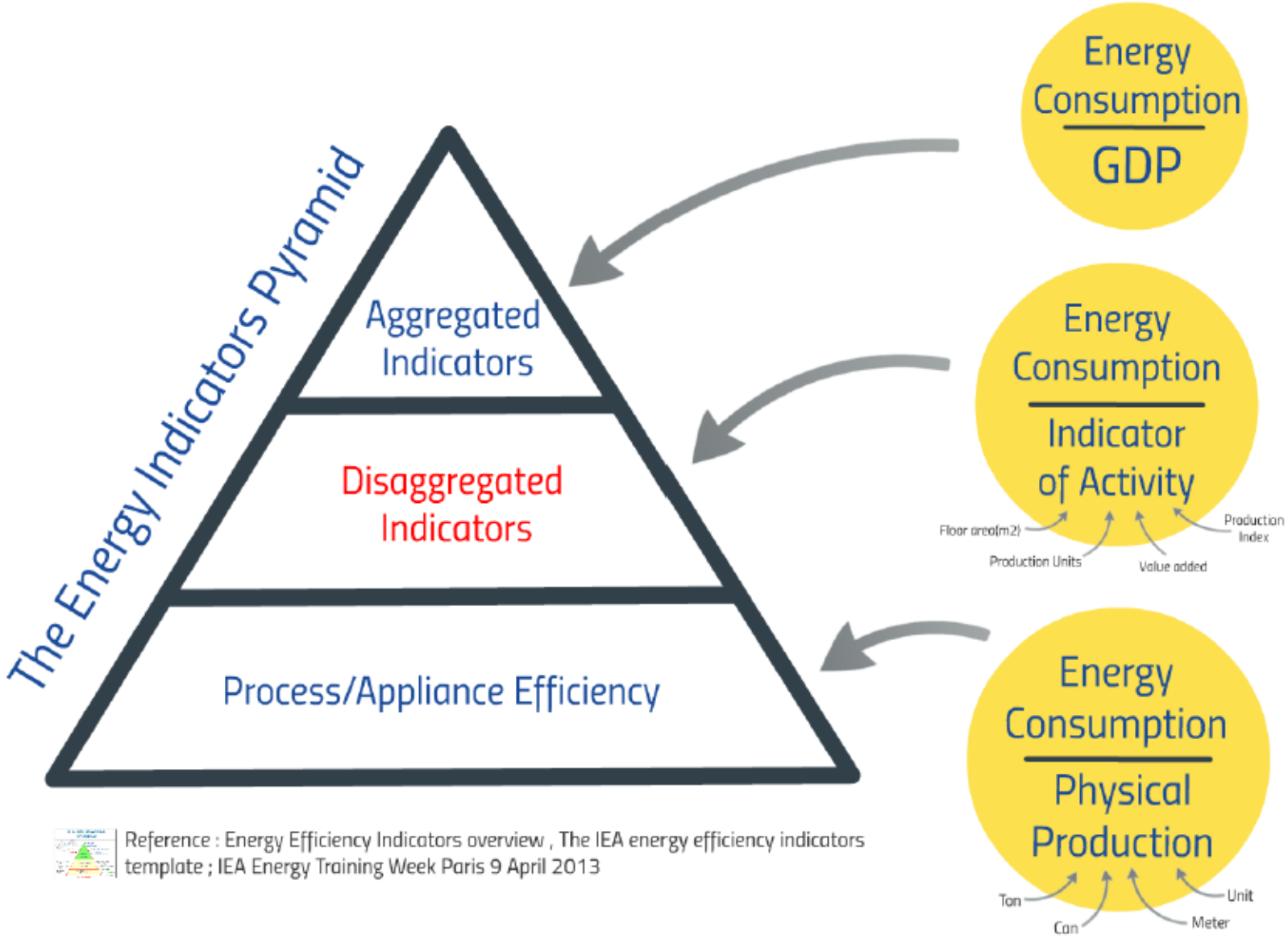
To develop additional **energy efficiency indicators (EEI)** for industrial and building sub-sectors to be used as energy baselines in implementing EE programs

Energy Consumption per GDP or indicator of activity

Use of EEI

- EEI are used to assess energy efficiency trends, to compare energy performance across countries, and to calculate energy savings. EEI are calculated by dividing an energy consumption by indicators of activities, e.g., GDP, ton, m2, etc.
- There are 2 types of approaches, top-down and bottom-up indicators.

Energy Efficiency Indicator (EEI)



Reference : Energy Efficiency Indicators overview , The IEA energy efficiency indicators template ; IEA Energy Training Week Paris 9 April 2013

Energy Efficiency Indicator (EEI)

National	Sector	Sub-Sector
		
EI **15.34** (2011)	**EI** **12.80** (2011)	Food & Beverages **EEI** ???
		
	EI **3.30** (2011)	**EEI** ???
Energy consumption / GDP	Energy consumption / GDP by sector	Energy consumption / Indicator of Activity

Energy Consumption
- Value added
- Production Index
- Production Units

Energy Consumption
- Value added
- Floor area(m^2)

Source: Thailand Energy Efficiency Situation 2011 : DEDE

DEDE Thailand EE Situation 2013

ตาราง ดัชนีชี้วัดประสิทธิภาพการใช้พลังงานขั้นสุดท้ายจำแนกตามสาขาเศรษฐกิจ

TABLA ENERGY INTENSITY BY ECONOMIC SECTORS

หน่วย : พันตันเทียบเท่าน้ำมันดิบต่อพันล้านบาท

unit : ktoe / thousand million baht

สาขา	2552 2009	2553 2010	2554 2011	2555 2012	2556 2013	SECTORS
เกษตรกรรม	8.91	9.17	9.29	9.20	9.34	AGRICULTURE
อุตสาหกรรม	12.12	11.41	11.54	11.65	11.74	INDUSTRY
บ้านอยู่อาศัย	4.48	4.28	4.61	4.34	4.45	RESIDENTIAL
ธุรกิจการค้า	3.36	3.65	3.44	3.13	3.25	COMMERCIAL
ขนส่ง	5.66	5.35	5.54	5.36	5.35	TRANSPORTATION

DEDE Thailand EE Situation 2013

ตาราง ดัชนีชี้วัดประสิทธิภาพการใช้พลังงานขั้นสุดท้ายจำแนกตามสาขาย่อยของอุตสาหกรรมการผลิต

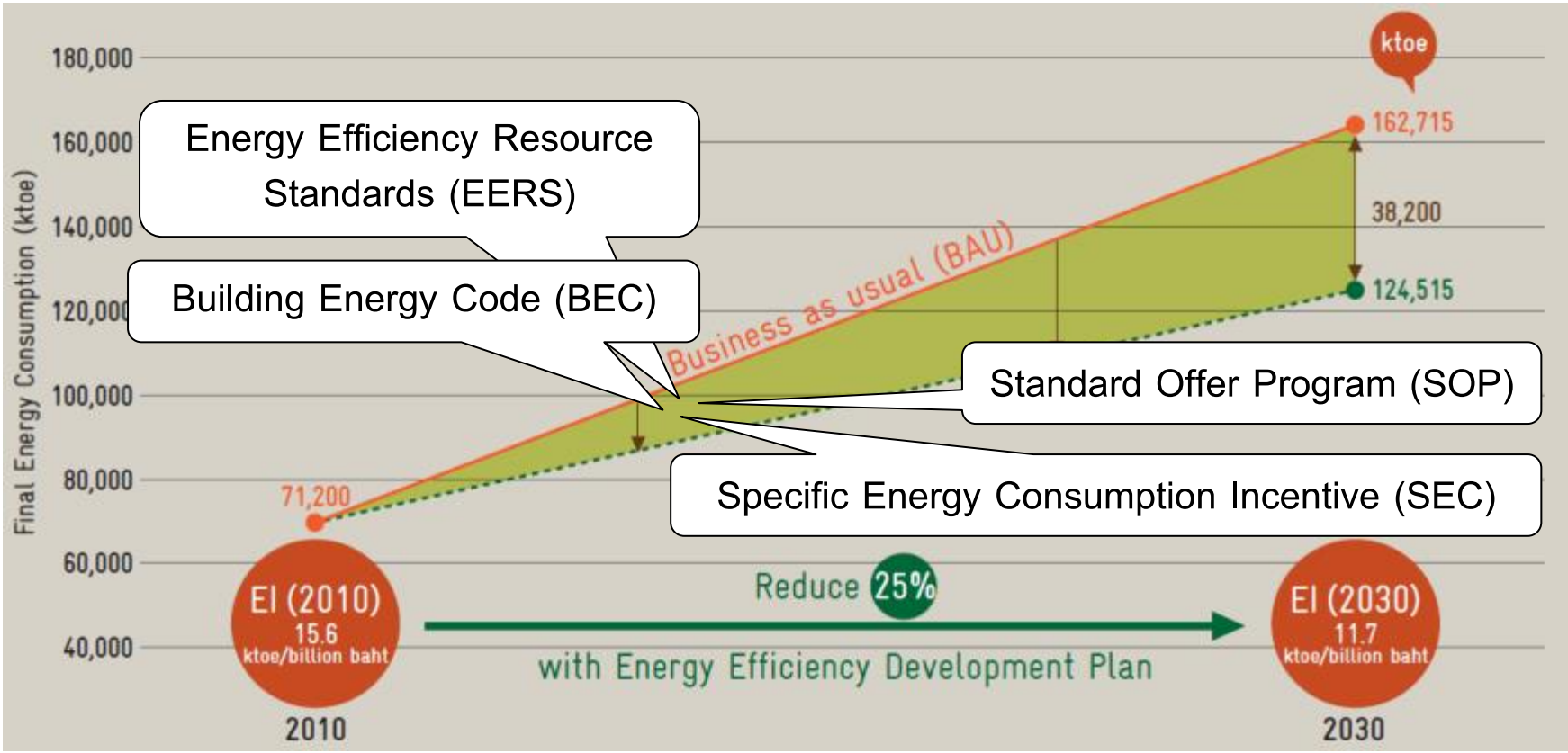
TABLE ENERGY INTENSITY BY MANUFACTURING SUB SECTORS

หน่วย : พันตันเทียบเท่าน้ำมันดิบต่อพันล้านบาท

unit : ktoe / thousnad million baht

สาขา	2552 2009	2553 2010	2554 2011	2555 2012	2556^{p} 2013^{p}	SECTOR
1. อาหารและเครื่องดื่ม	17.29	16.31	16.31	16.42	16.50	1. FOOD AND BEVERAGES
2. สิ่งทอ	3.39	2.87	3.05	3.74	4.20	2. TEXTILES
3. ไม้และครื่องเรือน	9.10	9.08	9.22	9.73	9.80	3. WOOD AND FURNITURE
4. กระดาษ	23.69	22.60	21.33	20.73	20.14	4. PAPER
5. เคมี	8.01	7.54	7.11	7.74	7.96	5. CHEMICAL
6. อโลหะ	74.47	72.97	67.74	67.32	62.31	6. NON - METALLIC
7. โลหะขั้นมูลฐาน	31.50	31.25	31.01	30.88	30.79	7. BASIC METAL
8. ผลิตภัณฑ์โลหะ	1.45	1.44	1.67	1.67	1.74	8. FABRICATED METAL
9. อื่น ๆ	15.51	15.50	15.49	15.22	15.10	9. OTHER (UNCLASSIFIED)

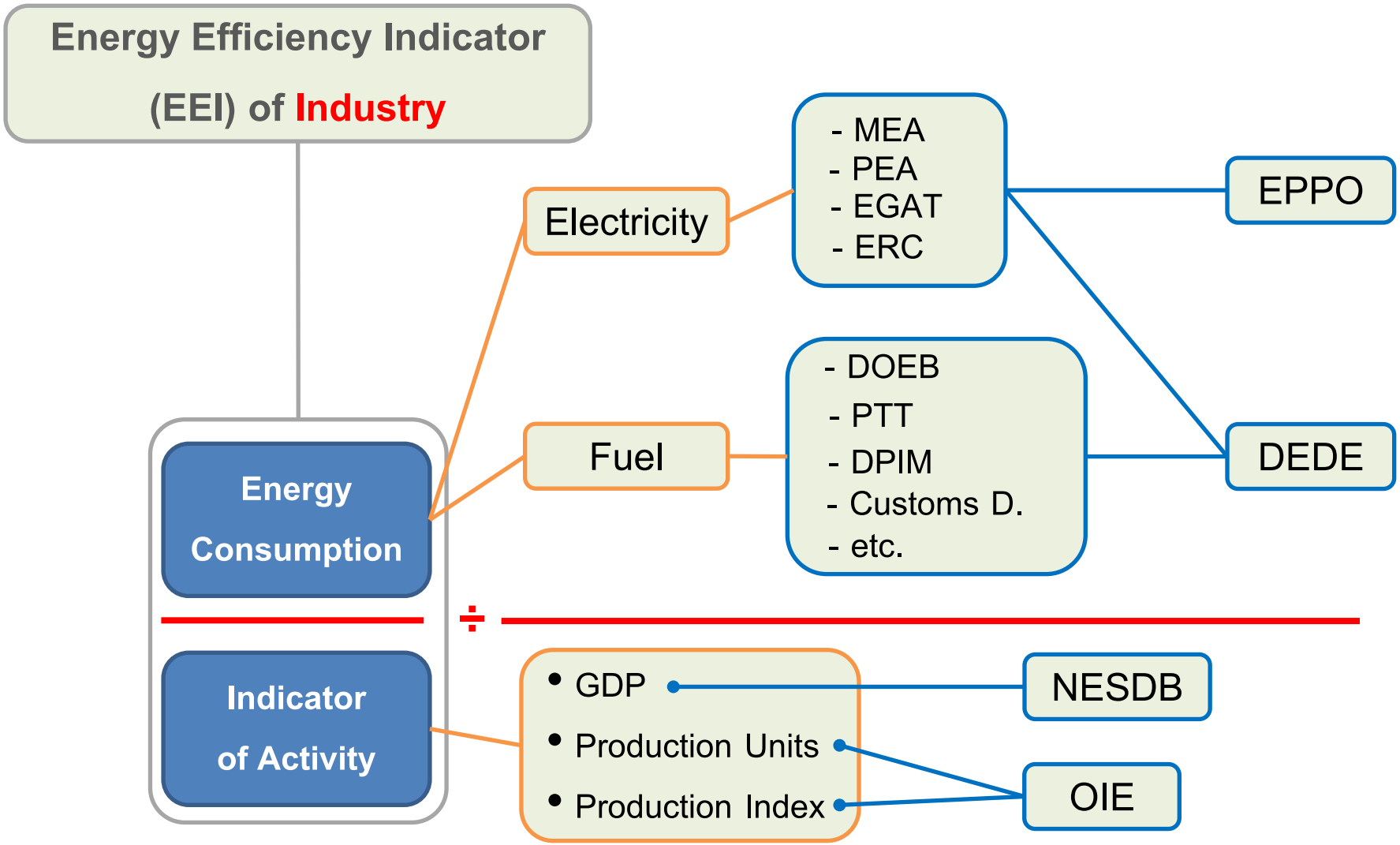
Energy Efficiency Development Plan 2011-2030



Encouragement of EE needs new EE policies:

- What effect do they have?
- Which one works best?
- Which policy has best “value for money”?

Energy Efficiency Indicator (EEI)



06/07/2015

Economic data availability

คณะกรรมการพัฒนาเศรษฐกิจและสังคมแห่งชาติ (สภาพัฒน์) NESDB

- GDP (Value added) by sub-sectors **

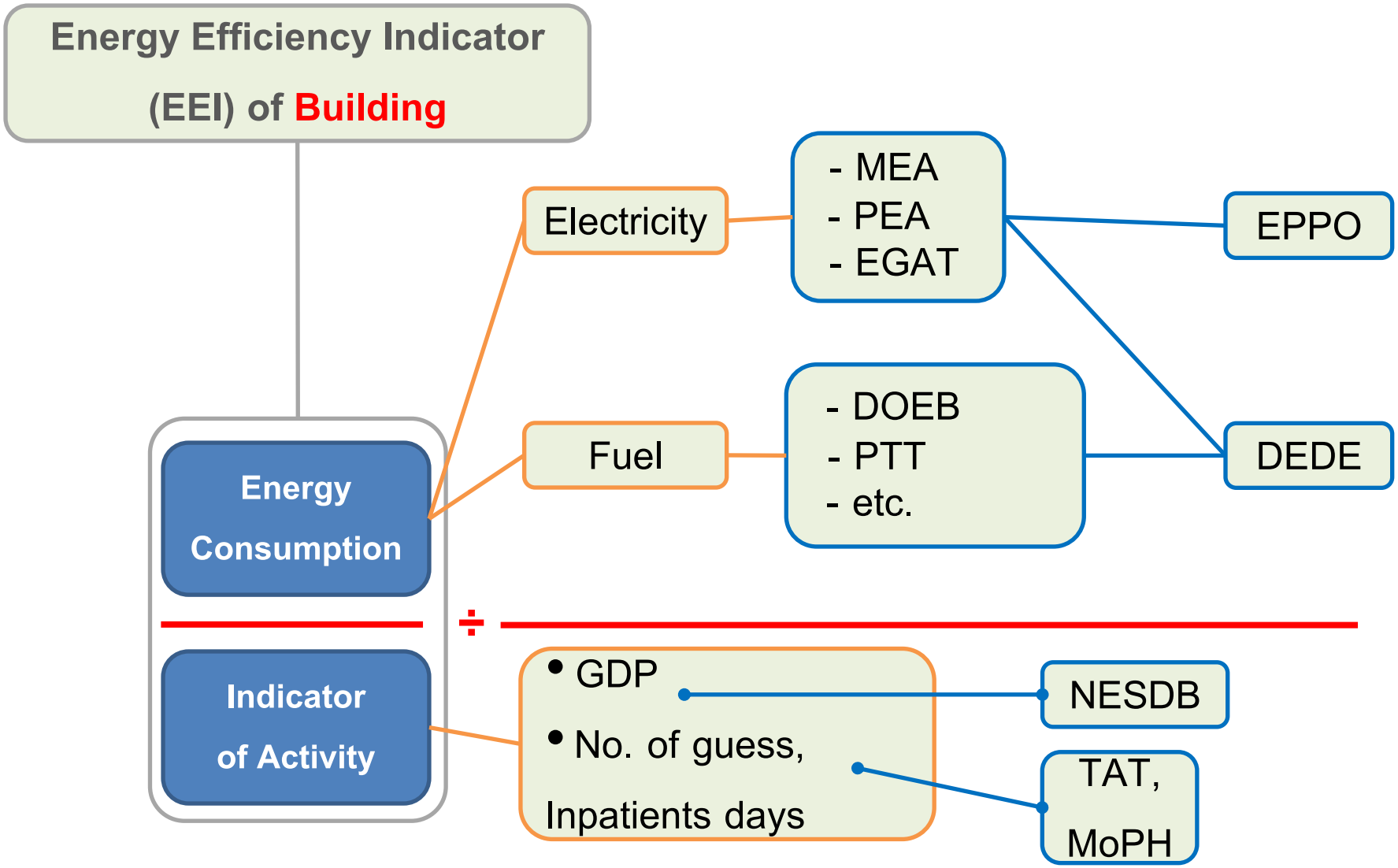
สำนักงานเศรษฐกิจอุตสาหกรรม OIE

- Production Units
- Industrial Production Index

** value added คำนวณได้จากส่วนต่างระหว่างมูลค่าการผลิต (Gross Output) และค่าใช้จ่ายขั้นกลาง(Intermediate Cost) ในการผลิตหรือการบริการ

** Value added can be calculated from the different of gross output and intermediate cost of productions and services.

Energy Efficiency Indicator (EEI)



06/07/2015

EEI Database

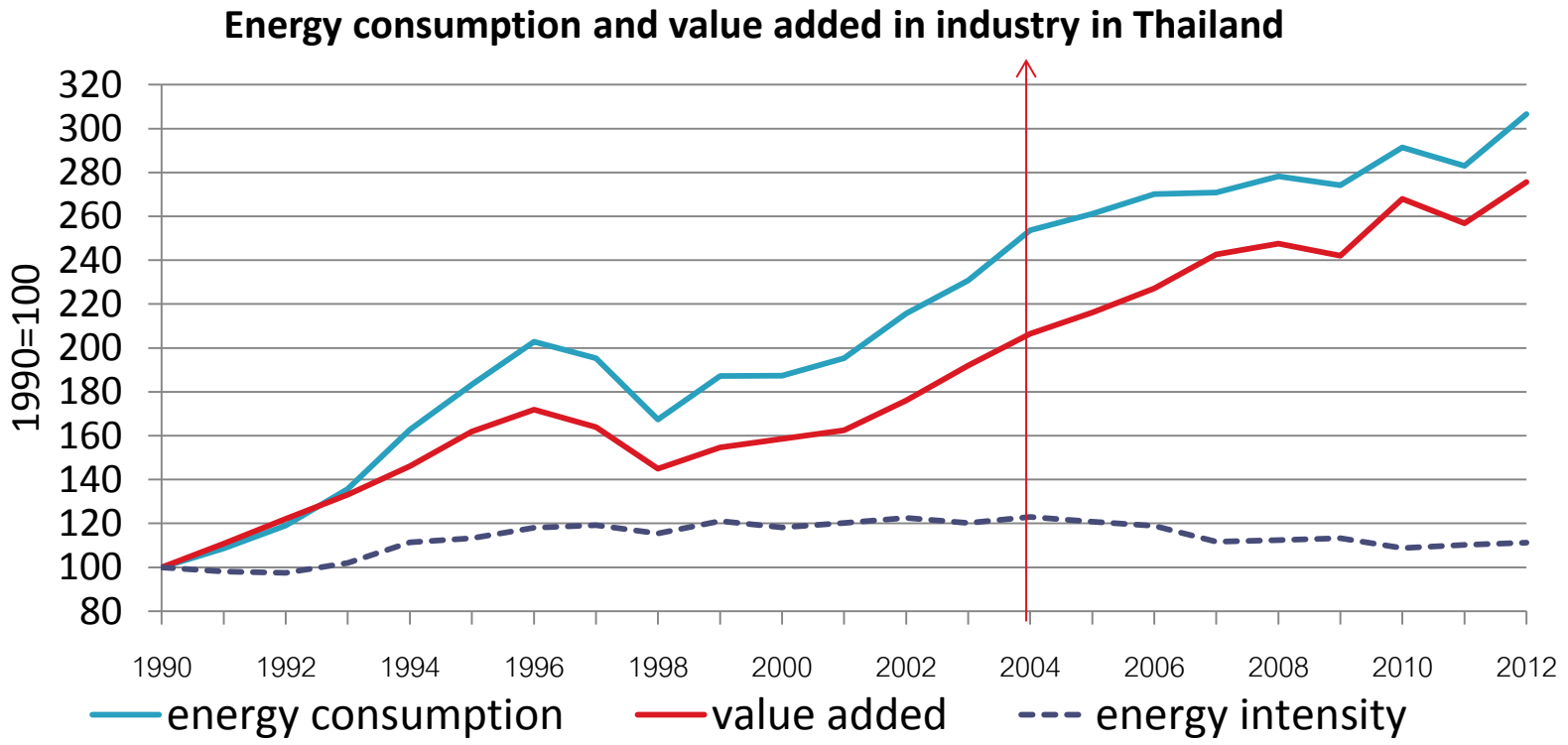
Content and organisation of the data spreadsheet

- The database spreadsheet developed for the TGEP-EEDP project is organized by in 5 sectoral sheets, as follows:
  1. **Industry**: data by industrial branch
  2. **Services**: public an commercial sectors
  3. **Households**: data on equipment and end-use
  4. **Transport**: data by transport mode
  5. **Macro**: GDP by sector and energy balance data on primary energy consumption and final energy consumption by sector and energy types

EEI for Industrial Sector

Energy consumption and value added in industry

- From 1990 to 1997 the energy consumption increased much faster than the value added (by 2.5%/year over 1990-1997).
- Between 1999 and 2004 the energy remained roughly stable
- Since 2004 the consumption increased less than the value added and the energy intensity has been decreasing by 1.2%/year on average. Is it due to energy savings?



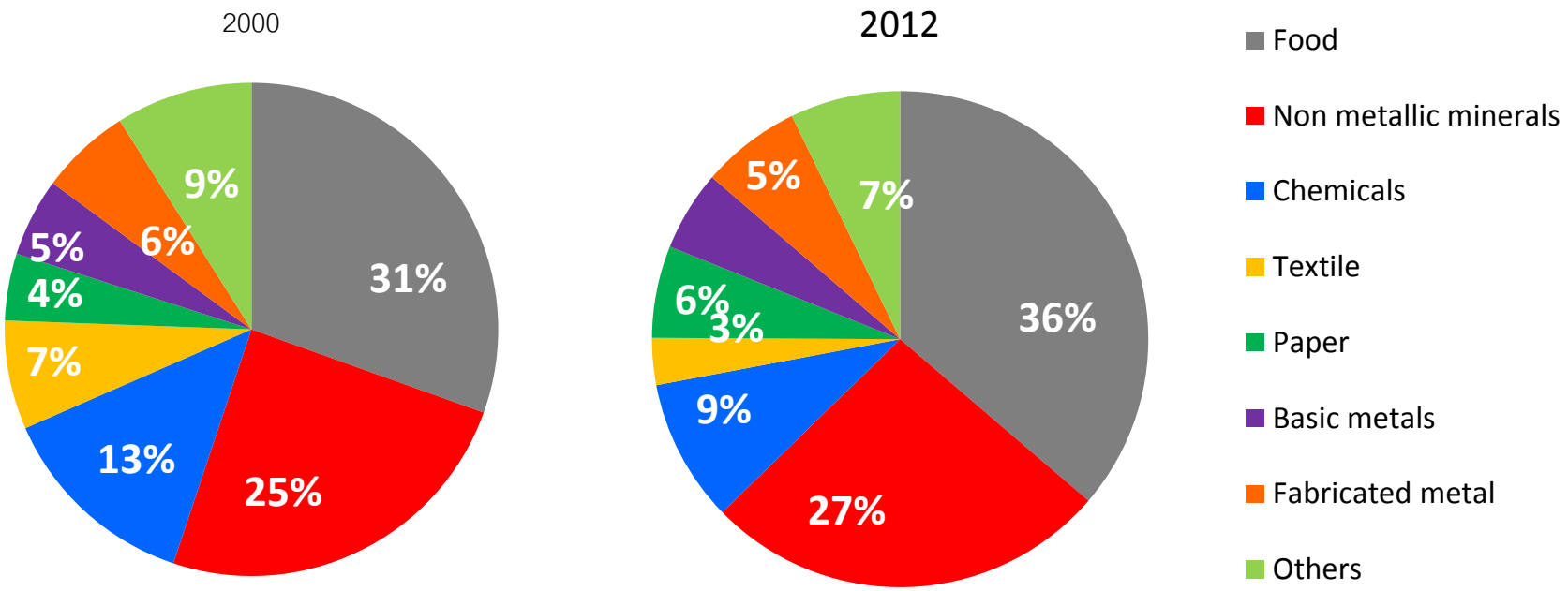
Enerdata

Sources: energy consumption: DEDE; value added: NESDB
Industry includes mining, manufacturing and construction

Energy consumption by industry sub-sector

- Two sub-sectors dominate the energy consumption of industry with more than 60% of total consumption : food (including beverages and tobacco) and non metallic minerals (mainly cement).
- The share of these 2 sub sectors is even increasing: from 56% in 2000 to 63% in 2012
- Decreasing share of textiles and chemicals

Energy consumption of industry by sub-sector in Thailand



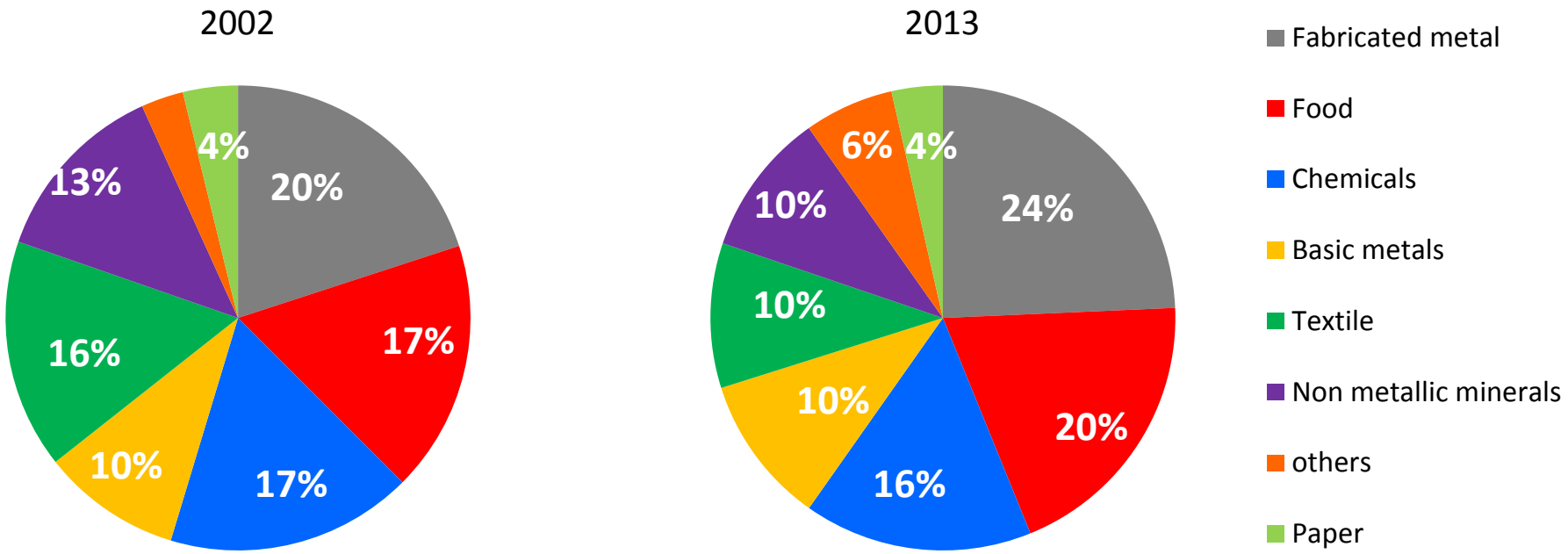
Source: DEDE

Enerdata

Electricity consumption by industry sub-sector

- Three sub-sectors represent 60% of the electricity consumption of industry: machinery & metal products (automobiles and electronics), food and chemicals.
- Increasing share of machinery (+4 points) and food (+3)
- Significant decrease in the share of textiles (-6) and non metallic minerals (-3)

Electricity consumption of industry by sub-sector in Thailand



Source: DEDE

Energy efficiency indicators for industry: case of Thailand

- Two types of indicators of specific energy consumption by industrial sub-sector have been considered to assess energy efficiency trends in industry, corresponding to different levels of disaggregation :

  - Specific energy consumption by main industry sub-sector (i.e., at 2 digits TSIC level), calculated by relating the energy consumption, from DEDE energy balance, to an index of production, from OIE ;

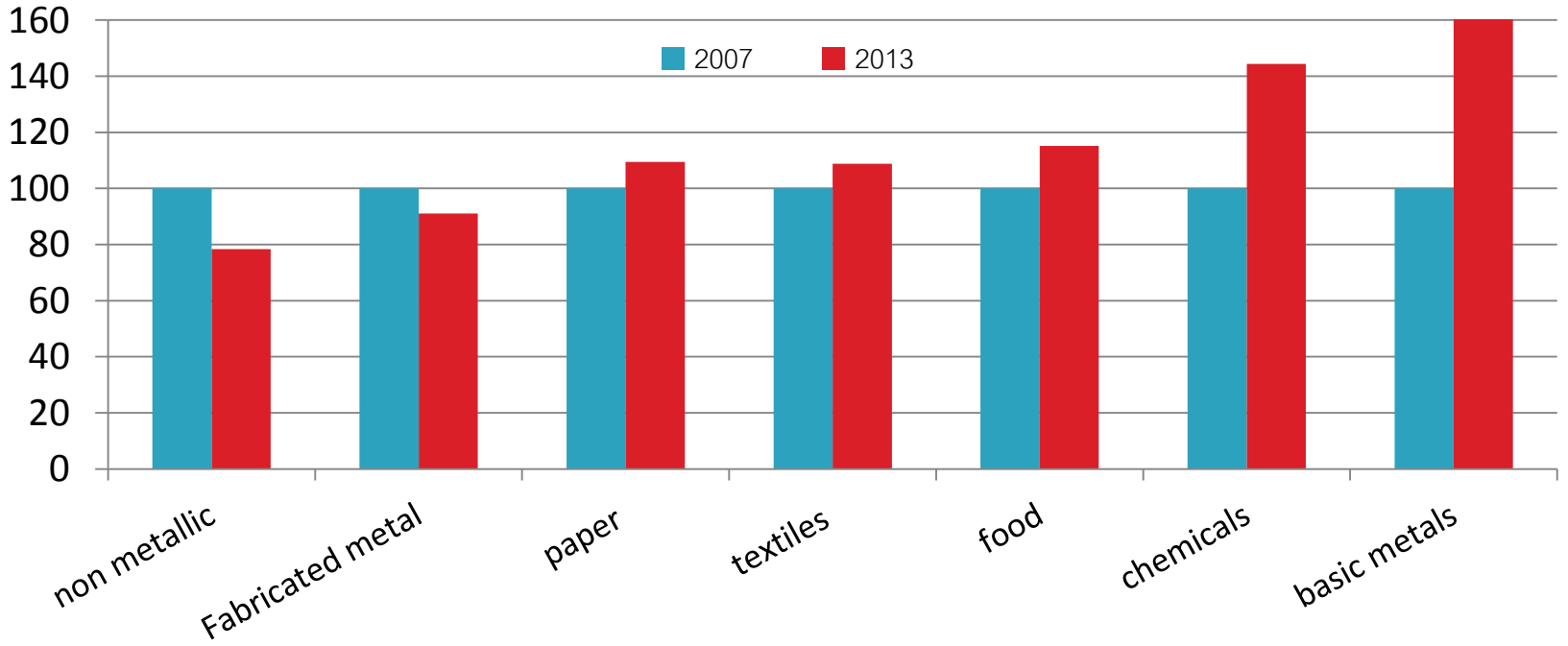
  - Specific energy consumption per unit of physical production for energy intensive production), relying on more detailed data (at 3 to 5 digits level); here, results will be shown only for electricity, based on EPPO data; data for other fuels collected from designated facilities by DEDE are not yet finalised and will be added soon to complement the picture (mainly for cement and sugar).

.

Trends in specific **energy** consumption by 2 digits sub-sectors

- A decrease generally corresponds to energy efficiency improvement: this is the case of non metallic (i.e. cement) and equipment (i.e. automobiles and electronics).
- An increase does not necessary means a deterioration of energy efficiency but generally is linked to change in the structure of production within the sub sector;

Specific energy consumption by industry sub-sector at 2 digits level (2007=100) (Thailand)



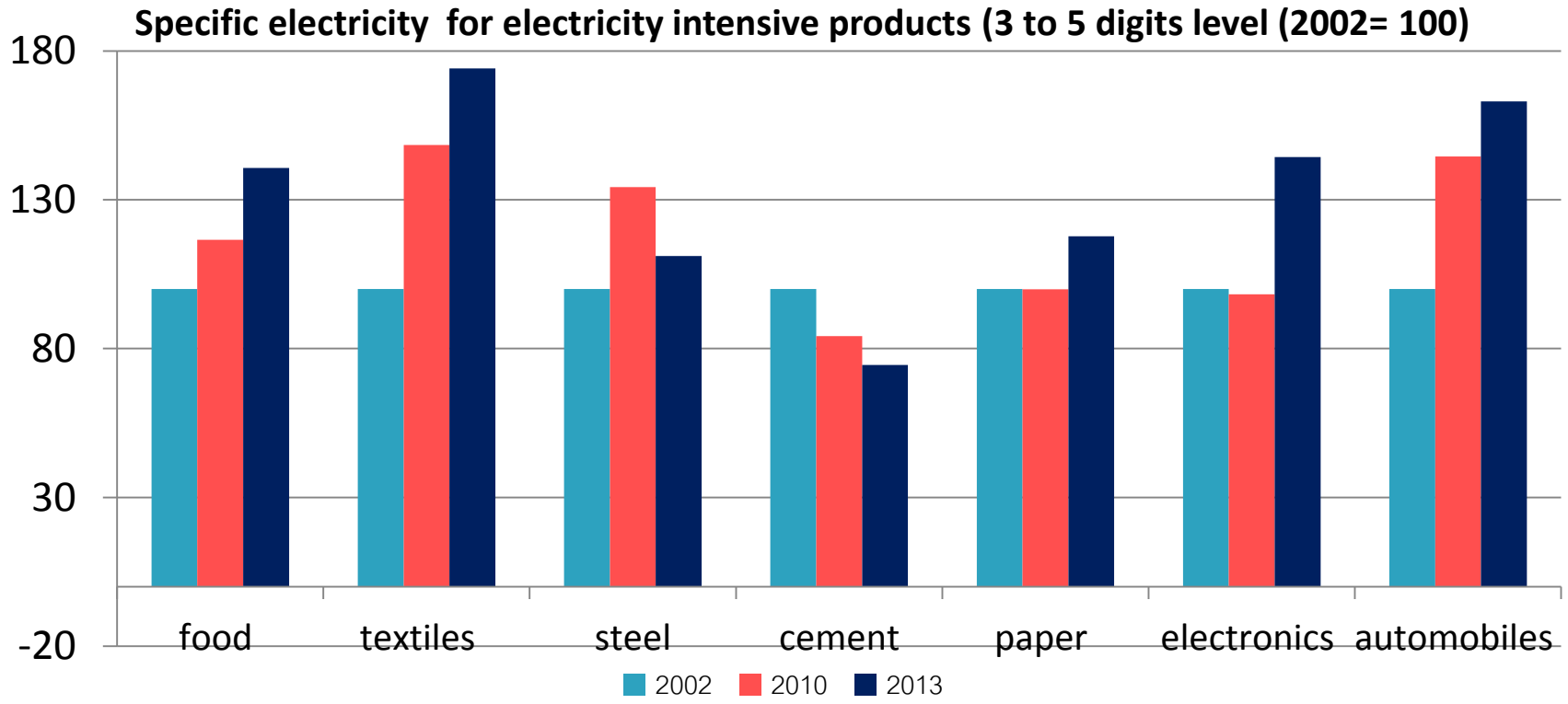
Specific energy consumption calculated as a ratio between the energy consumption (from DEDE) and the production index (from OIE)

Food: food, beverage & tobacco; Textiles: textile, clothing & leather; Fabricated metals = equipment, machinery, transport equipment

Trends in specific consumption for selected energy intensive products: case of **electricity**

•Apart from cement and steel (since 2010), the specific electricity consumption is increasing;

•The increase does not mean that there is no efficiency improvement as mechanization and automation implies an increasing use of electricity, and electricity may substitute fossil fuels for certain uses ➔ energy efficiency should only be looked at the level of all types of energy sources.

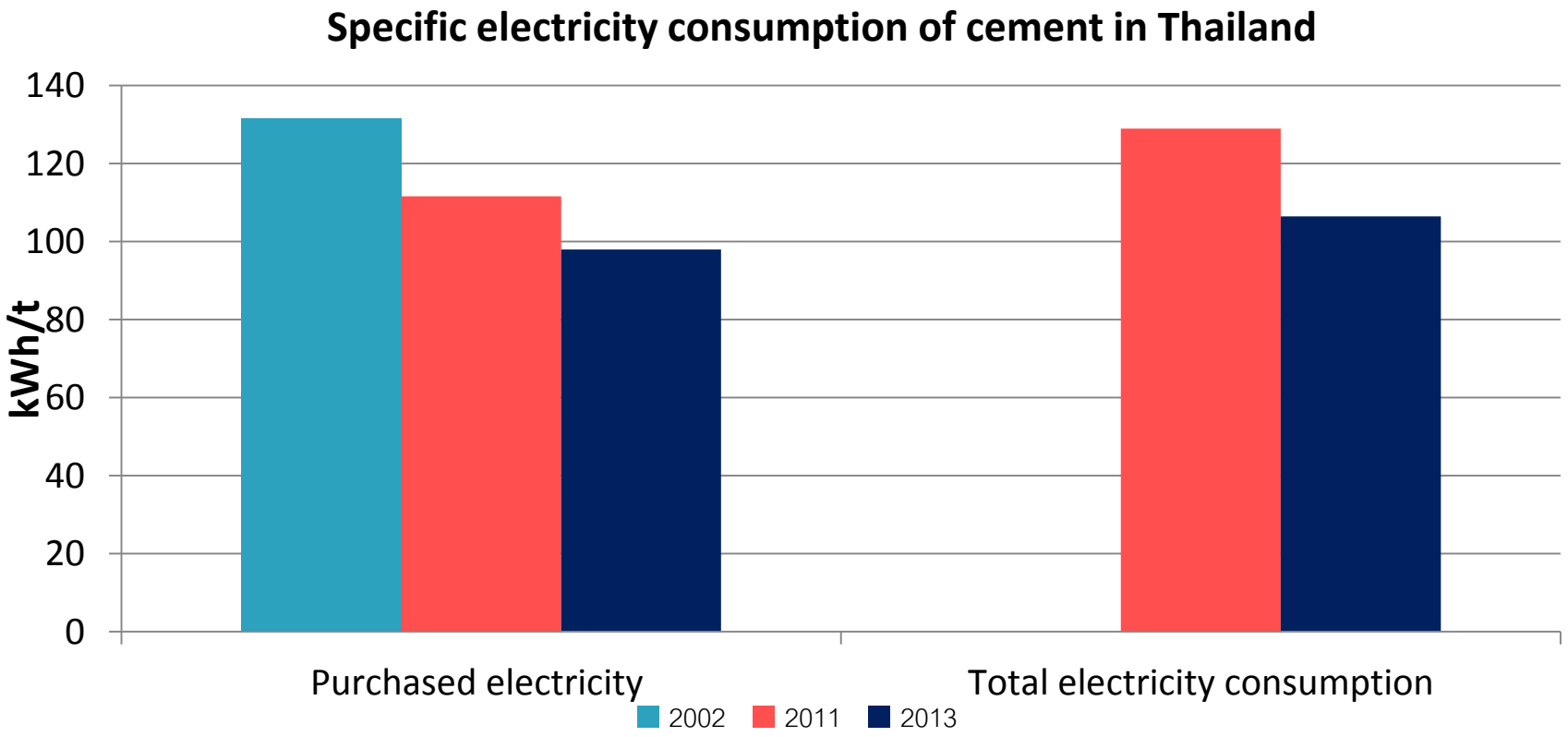


Enerdata

Specific electricity consumption: ratio electricity consumption (source EPPO) over physical production for steel, cement, paper, automobiles and production index for others.

Case study on cement

- Decrease by 25% of the purchased specific electricity consumption per ton of cement since 2002 and by 12% since 2011.
- To assess energy efficiency improvement, data on specific consumption should include the total electricity consumption and not only the purchased electricity;
- Data on off grid generation are only available since 2011 from ERC and actually the reduction is even stronger on the total specific electricity consumption

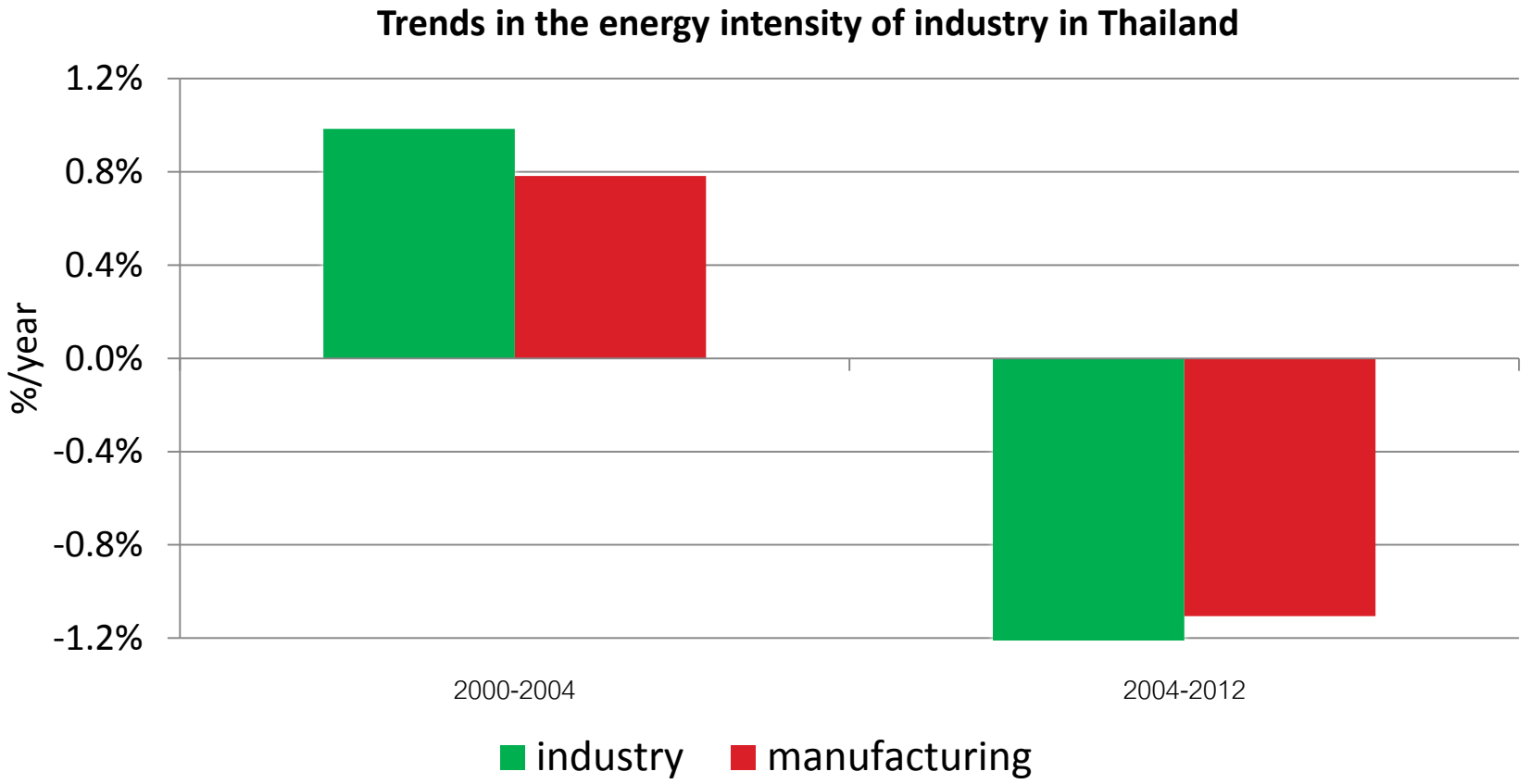


Purchased electricity from EPPO; off grid generation from ERC; total: purchased + off grid

Trends in energy intensities in industry and manufacturing

- Since 2004 the energy intensity of industry has decreased by 1.2%/year (slightly less for manufacturing only).

This trend may be the result of energy efficiency improvements but also of changes in the structure of production towards less intensive sub-sectors, i.e. the so called "structural changes".



Industry includes manufacturing, construction and mining

How structural changes in industry affect the overall energy intensity of industry

- All industrial sub-sectors do not require the same amount of energy inputs to produce 1 Baht of value added. Some sub sectors are more energy intensive than others.

- Industrial growth is not uniform: some sub-sectors grow faster than others. As a result, the share of each sub-sector in the total value added of industry change over time: this is what is called **structural changes**.

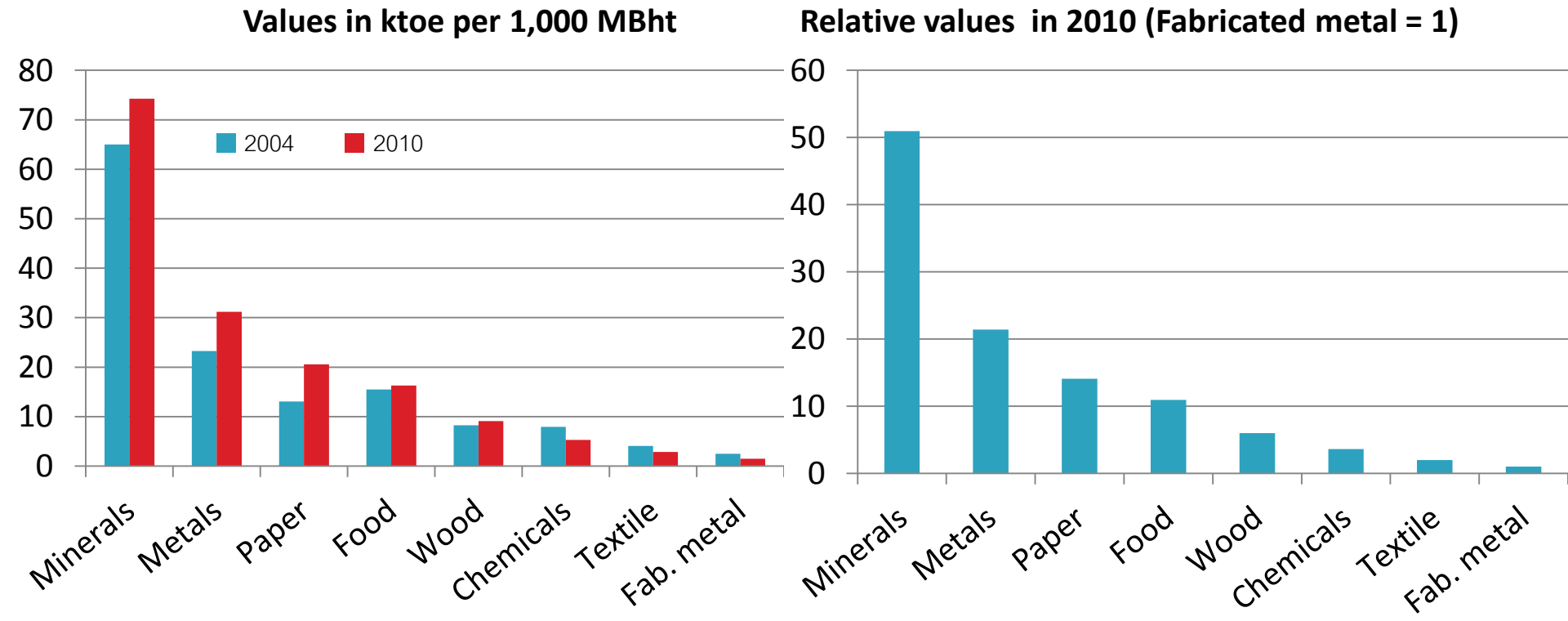
- If **less energy intensive sub-sectors grow faster** than energy intensive sub-sectors, this will reduce the overall energy intensity of manufacturing, all other things being equal, and this is **not linked to energy efficiency improvements.**

- Therefore, it is important to clean the energy intensity variation from these structural changes

Difference in energy intensities by industry sub-sectors

Non metallic minerals and basic metals require respectively 50 and 20 times more energy to produce 1 baht of value added than fabricated metals, the less intensive sub-sector.

Energy intensities by industry sub-sectors in Thailand

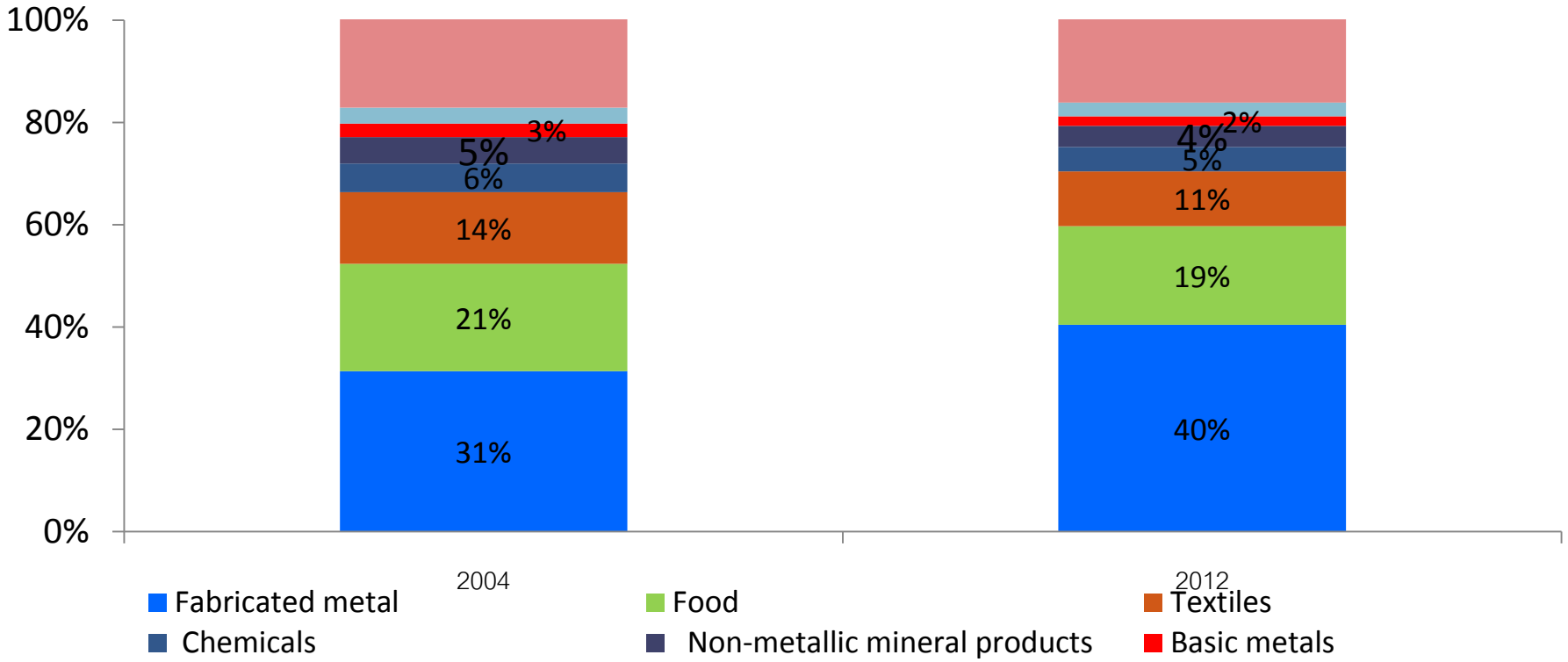


Source: based on data from DEDE and NESDB
Minerals: non metallic minerals; metals: basic metals;
Fabricated metals: machinery and electronics

Change in industry value added structure

- In Thailand , the share of machinery (i.e. automobiles and electronics), the less intensive sub-sectors, increased by 9 points between 2004 and 2012; this means that this sub sector grew much faster than the other sub -sectors
- In the same time share of food and to a lesser extent of non metallic minerals and basic metals, the 3 most energy intensive sub sectors, decreased (by respectively 2, 1 and 1 point)

Share of industry value added by sub-sectors in Thailand



Source: NESDB

Measuring the impact of structural changes in industry

- To quantify the impact of structural changes on the energy intensity of industry, the usual approach is to calculate a fictive energy intensity at constant structure, i.e. assuming that the structure did not change compared to a base year (i.e. 2004 here).

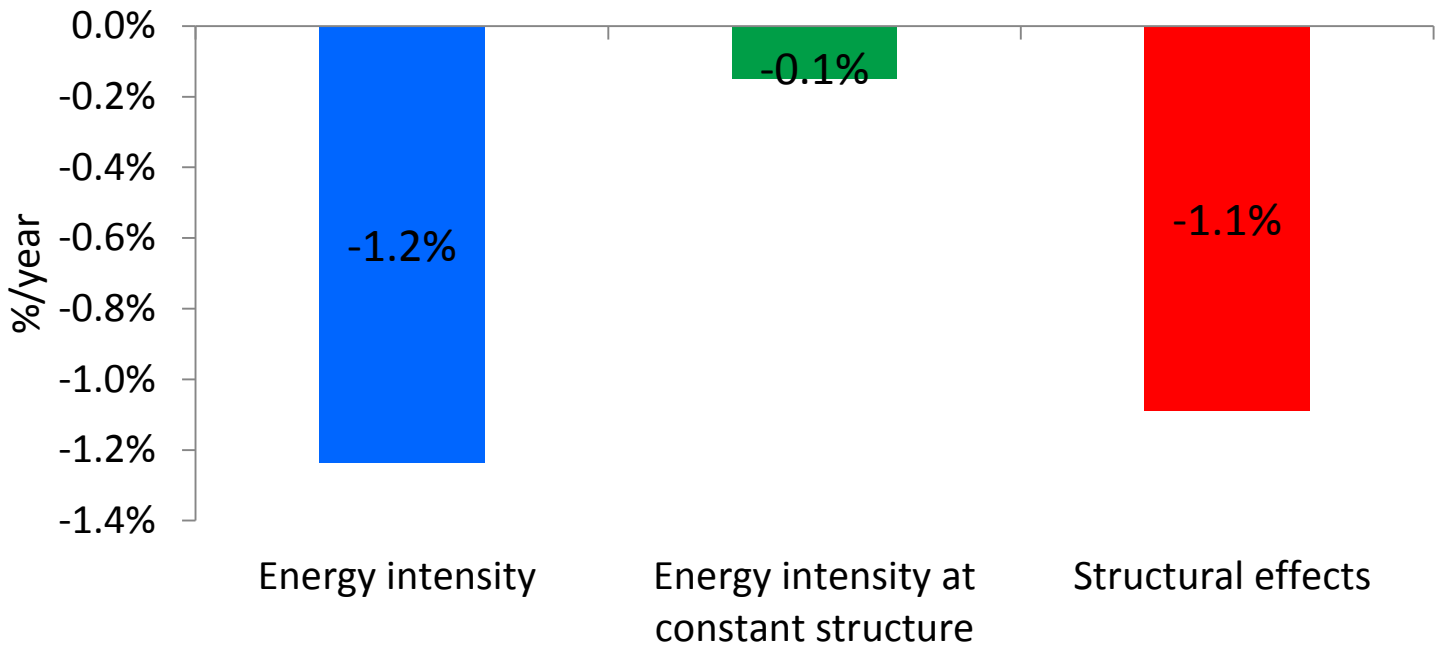
- This intensity at constant structure (IES) is calculated at year t (i.e.. 2012, here) with the sectoral intensities of year t and the value added structure of the base year (2004): $IES_t = \Sigma(VAi/VA)_{2004} * (Ei/VAi)_t$

- Comparing the trend in the actual intensity with that of the intensity at constant structure measures the impact of structural changes

Impact of structural changes on industry intensity

- Between 2004 and 2012, the energy intensity of industry decreased by 1.2%/year;
- At constant structure, i.e. without changes in the composition of industry, this energy intensity would have only slightly decreased, by around 0,1%/year;
- Structural changes towards less energy intensive branches, such as automobiles and electronics, contributed to decrease the energy intensity by 1.1%/year and explain almost 90% of the intensity reduction in industry.

Energy intensity of industry and structural changes in Thailand (2004-2012)

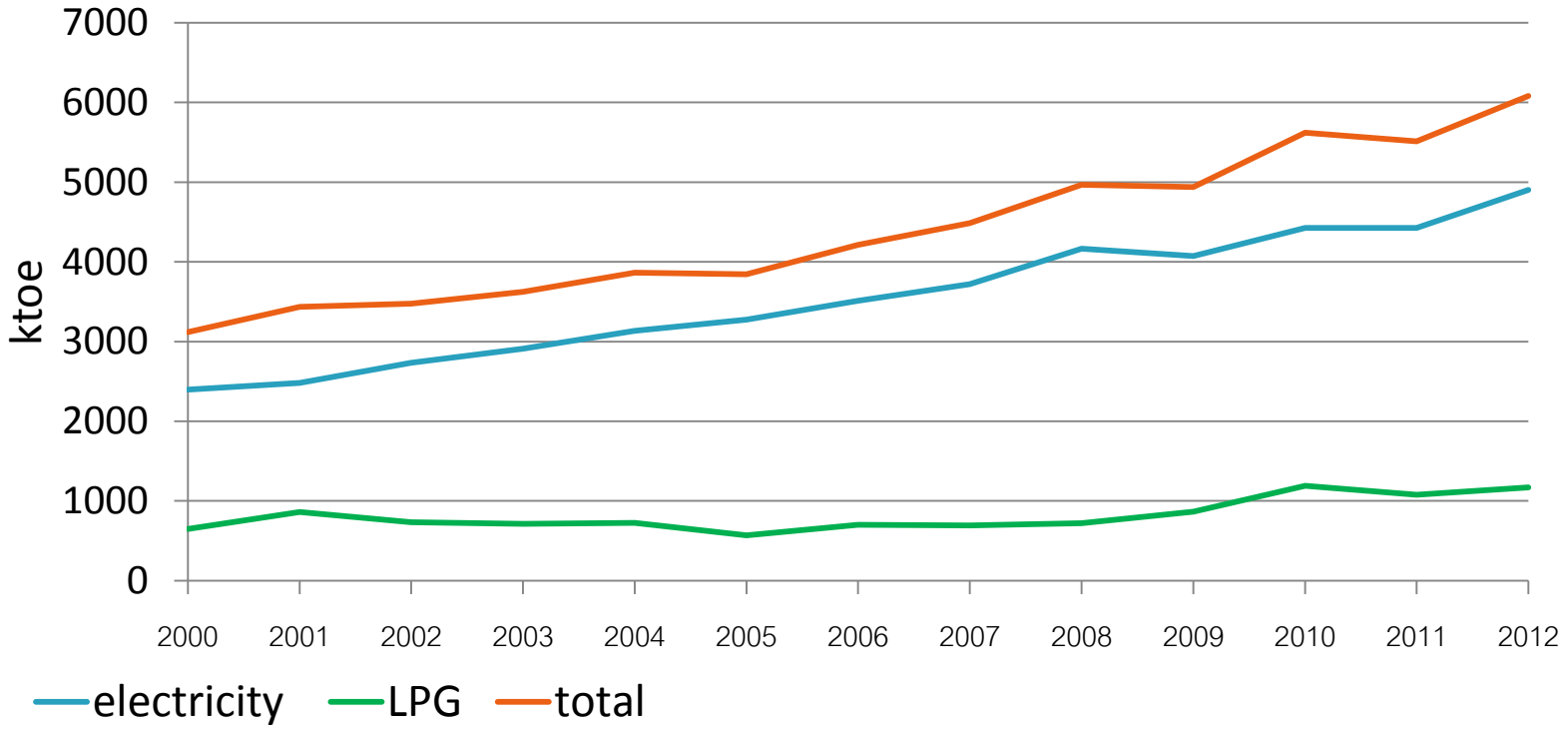


EEI for Services Sector

Energy consumption in services

- The sector includes public and private services (trade, hotels and restaurants, health and social work activities, education, administration etc...).
- Electricity represents about 80% of the service sector consumption and the rest is LPG used for cooking ➔ the focus will be on **electricity** in the presentation

Electricity and LPG consumption in services in Thailand

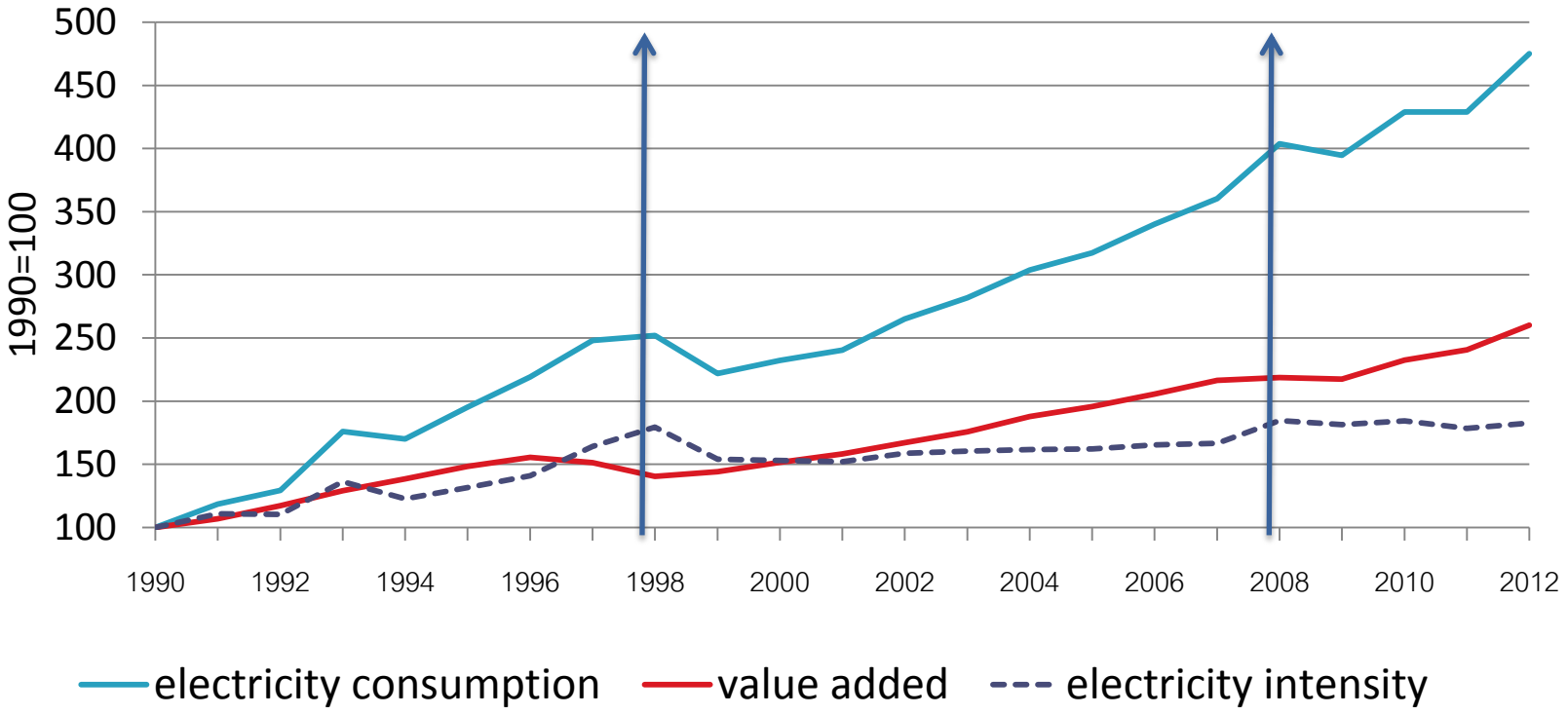


Sources: DEDE;

Electricity consumption and value added in services

- Until 1998, electricity consumption has increased much faster than the value added; between 2000 and 2008, the electricity consumption has grown slightly faster than the value added
- Since 2008 the consumption has increased slightly less than the activity of the sector.

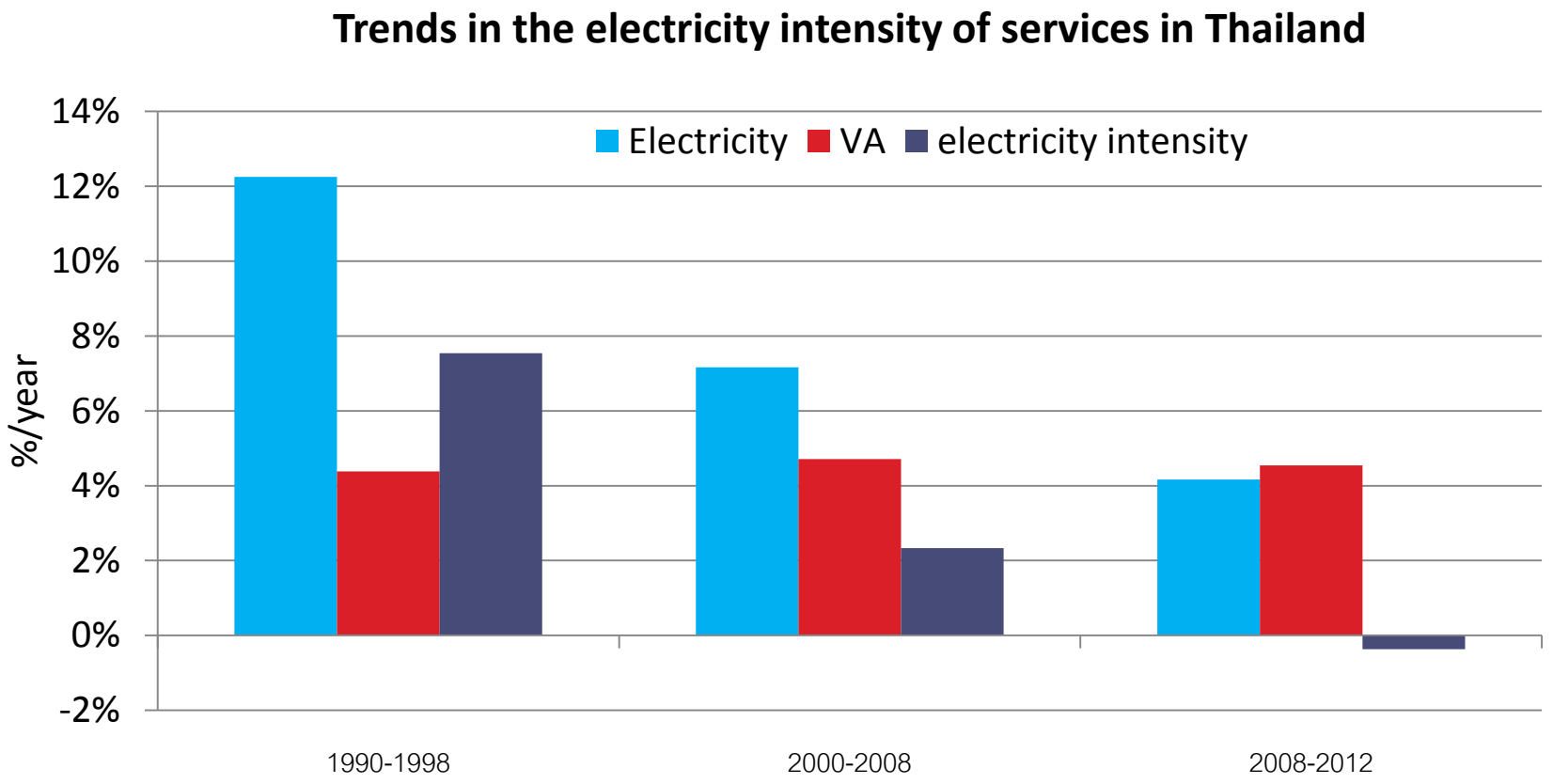
Electricity consumption and value added in services in Thailand



Sources: energy consumption: DEDE; value added: NESDB

Trends in energy intensities in services: a summary

- Until 1998, the electricity intensity has increased rapidly by 7.5%/year;
- This increase was much slower between 2000 and 2008, at around 2%/year.
- Since 2008 this a reverse trend with a slight decrease of the electricity intensity

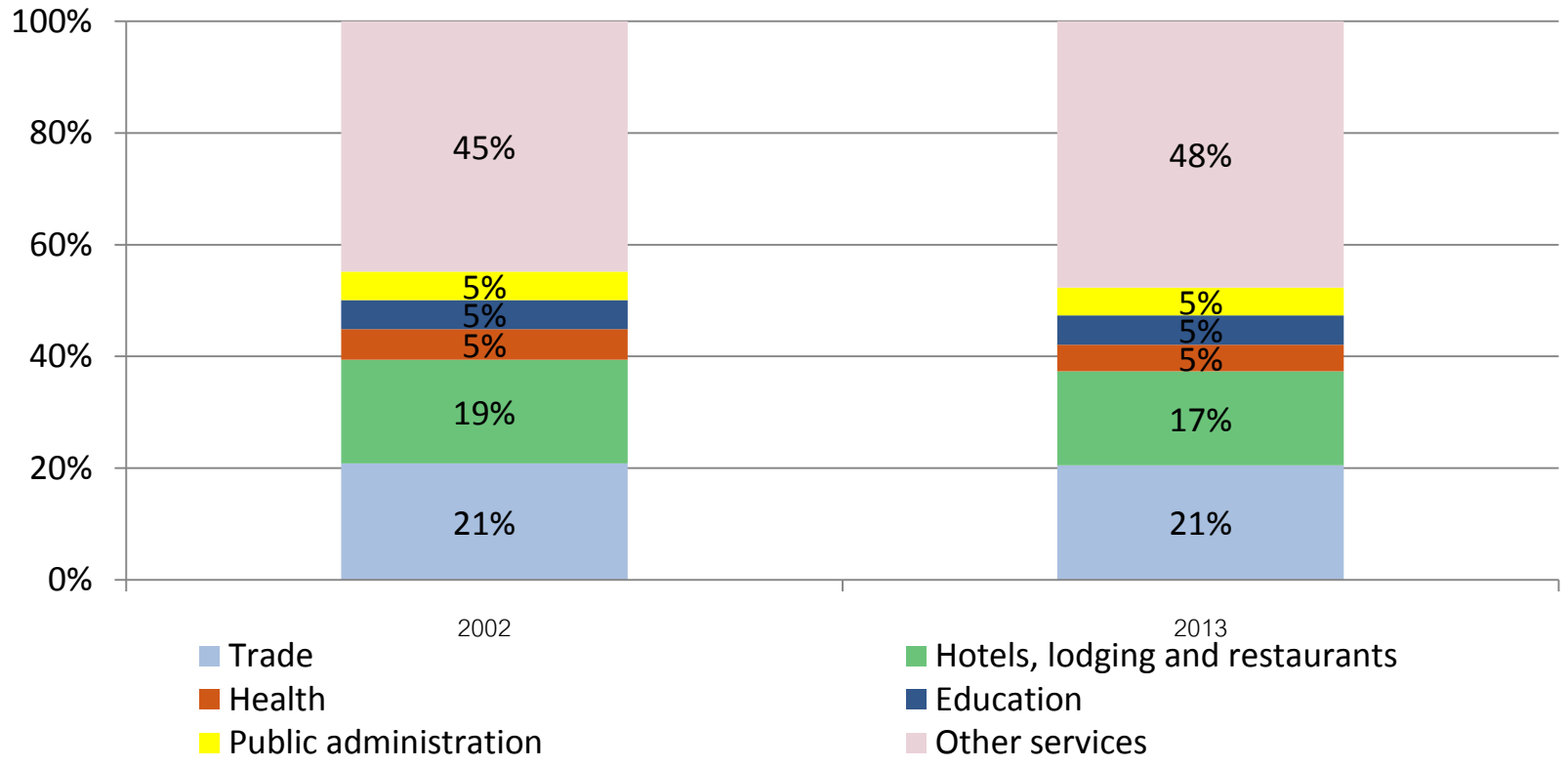


Enerdata

Electricity consumption by sub-sector in services

•Two sub–sectors represent around 40% of the electricity consumption: wholesale and retail trade (21%) and hotels, restaurants and other lodging (17%) ;
•Their share is relatively stable, except a slight decrease for hotels, lodging & restaurants.

Electricity consumption in services by sub sector at 2 digits level in Thailand

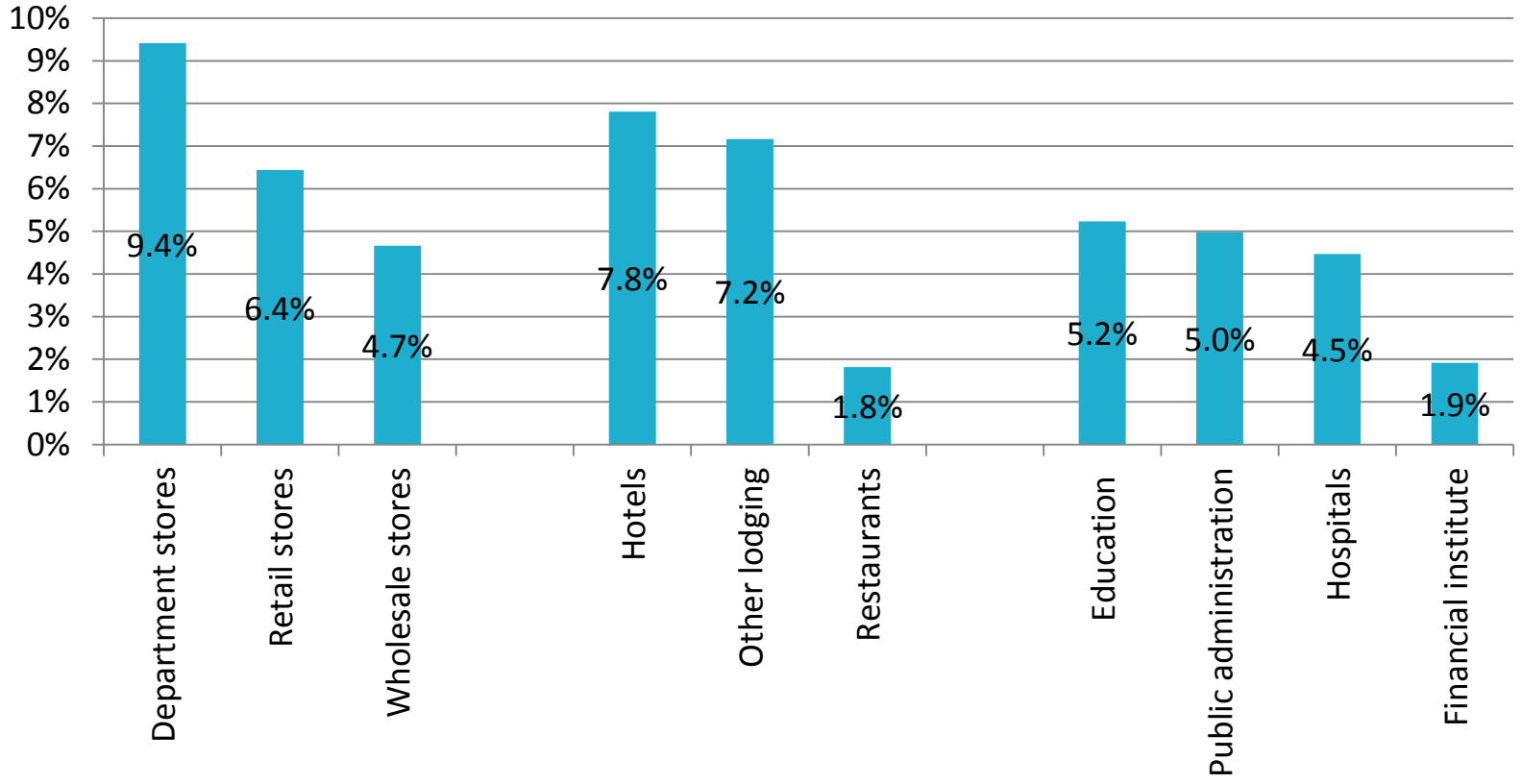


Source: EPPO

Electricity consumption by type of buildings in services

Department stores and hotels are the two largest types of buildings in terms of of electricity uses, with around 17% of the total.
They are followed retails stores and other lodging .

Share of 10 largest types of buildings in the electricity consumption of services in Thailand (2013)



Source: EPPO; other lodging include apartments that should normally be included with households

Indicators by sub- sector in services

- Three types of indicators have been considered:
  - Specific electricity consumption in **kWh per employee** by sub-sector for the 3 main 2 digits sub-sectors:
    - Wholesale and retail trade,
    - Hotels and restaurants
    - Health and social work activities.

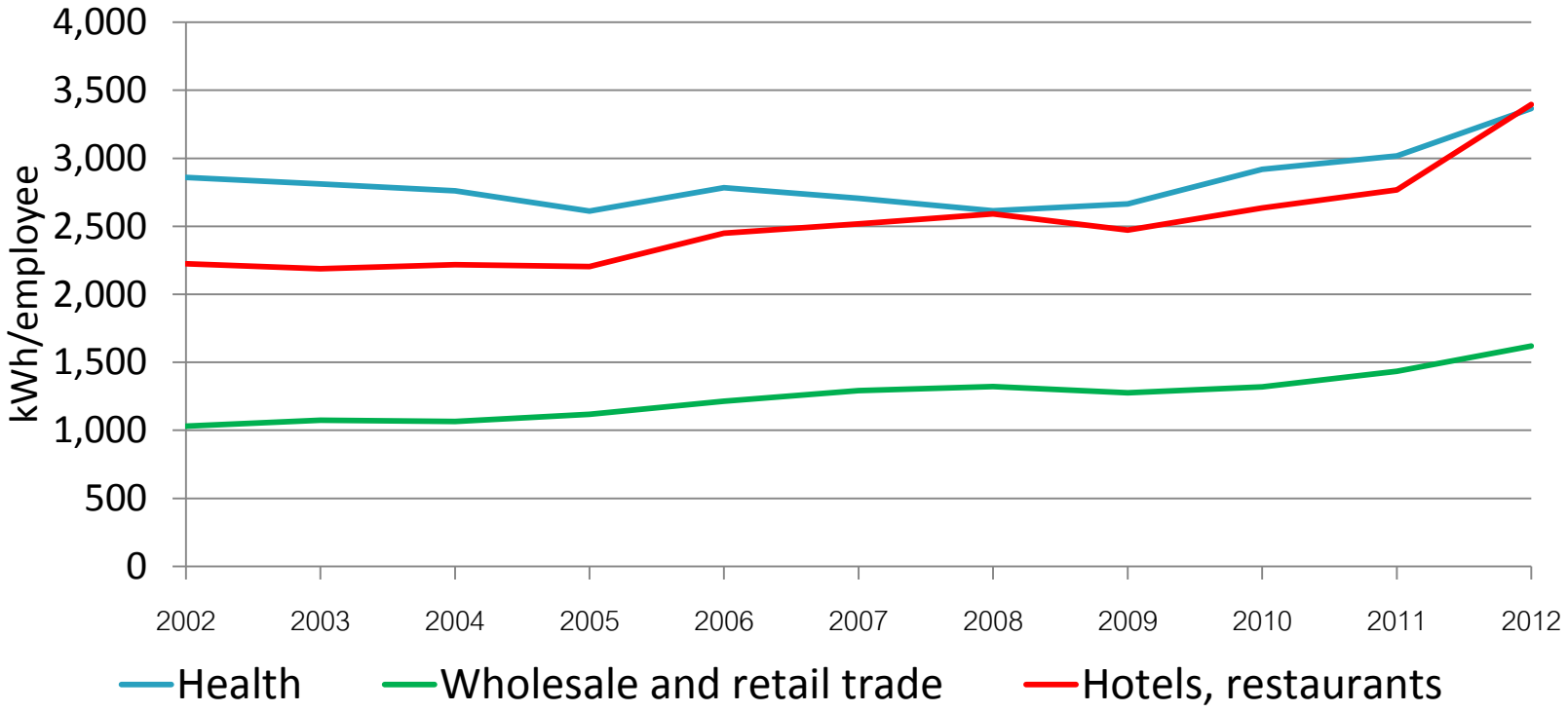
  - Specific electricity consumption **per unit of activity for main type of buildings,** specific to each sub sector (such as number of beds in hotels or hospitals or person-night in hotels…)

  - Specific electricity consumption **per m^2** for some buildings types based on data from designated buildings; however they will not be shown here as they are being finalized by DEDE.

Specific electricity consumption by main sub-sector in services

- Hotels/restaurants and health have vey similar level of electricity consumption per employee and trends
- This specific consumption is progressing much slower in the health sub sector (around 1.5%/year compared to 4-5%/year for hotels and trade)

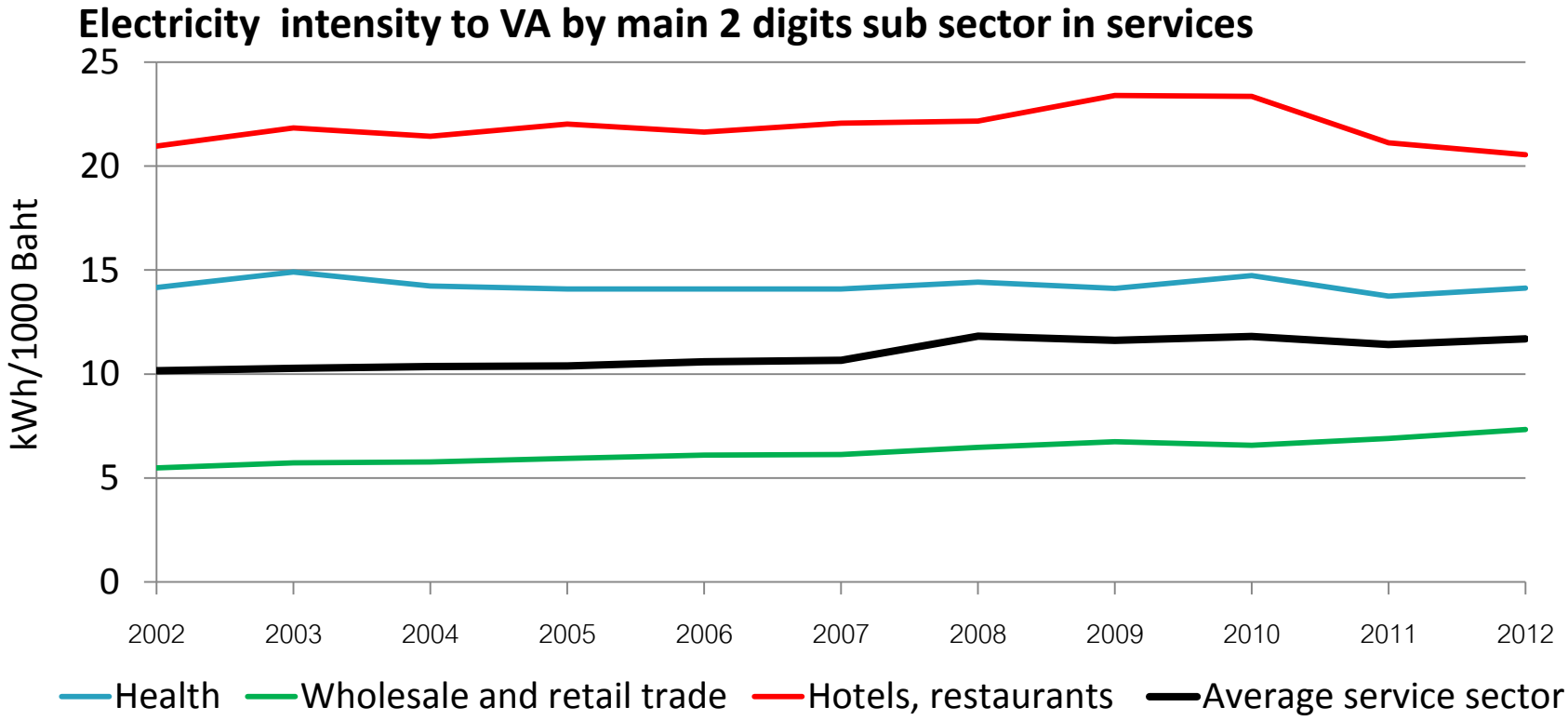
Specific electricity consumption by main 2 digits sub sector in services in Thailand



Sources: EPPO; wholesale and retail trade includes department stores;

Specific electricity consumption by main sub-sector in services

- Hotels/restaurants is the most intensive sub–sectors: it uses twice more electricity than the average of the sector to generate one Baht of value added and 3 times more than wholesale and retail trade;
- Its intensity has been decreasing since 2010 while that of trade is regularly growing.
- The share of hotels/restaurants in service value added increased from 7 to 8% from 2002 to 2012, while the share of trade decreased from 30 to 27%: these structural changes contributed to increase the total electricity intensity of services.

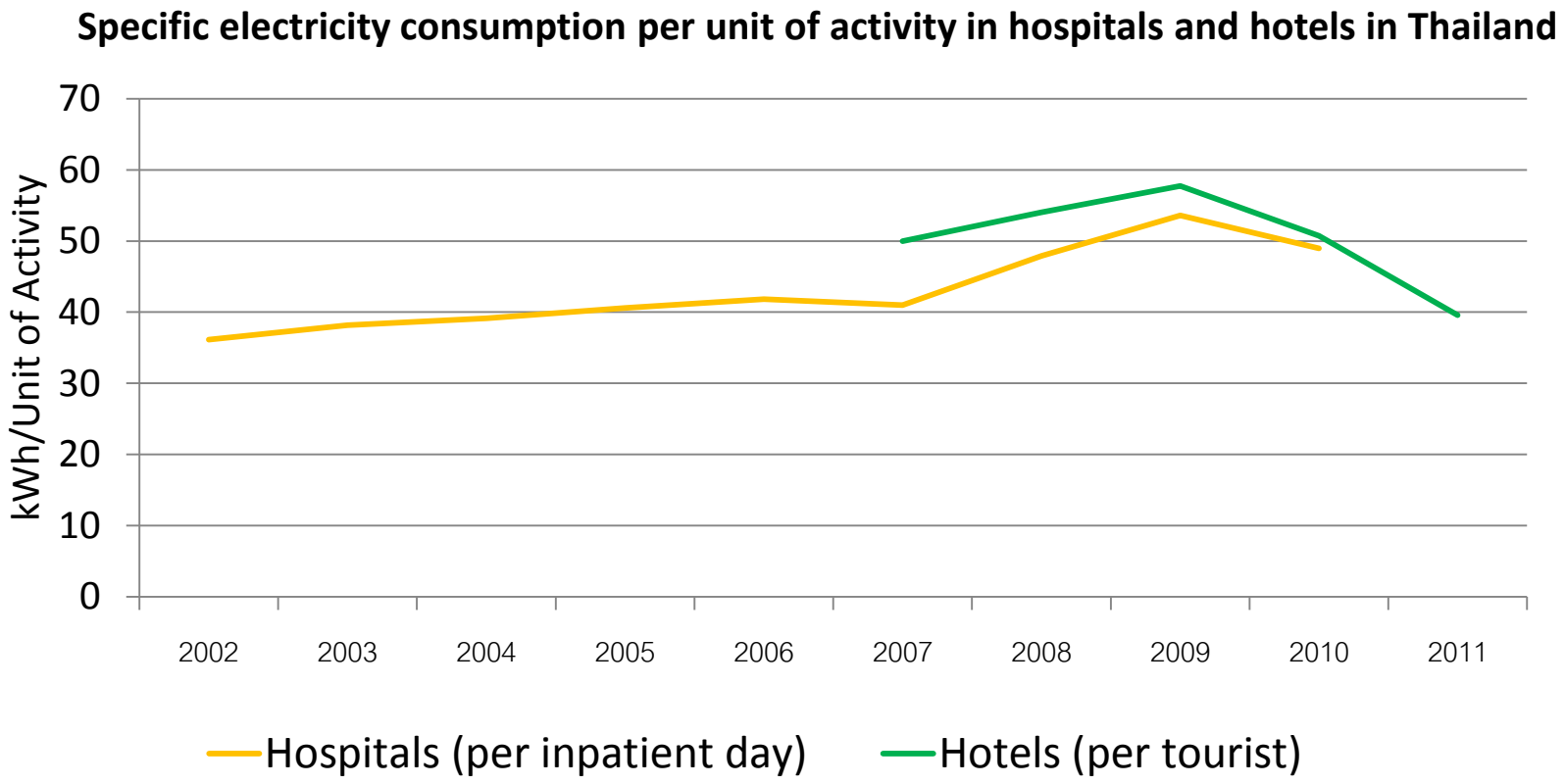


Enerdata

Sources: EPPO; wholesale and retail trade includes department stores;

Specific electricity consumption per unit of activity in selected buildings

Specific consumption is slightly progressing for hospitals.



Enerdata

Sources: electricity consumption: EPPO; persons nights (TAT); patient day (MOPH)

Discussion, Q & A

Thank You – Kop Khun Krup – Danke Schön

GDP - NESDB

Back

Table 3 Gross domestic product at current market prices by economic activities

(Millions of Baht)

	2004	2005	2006	2007	2008r	2009r	2010r	2011p
Agriculture	**646,344**	**700,380**	**790,175**	**848,688**	**978,015**	**940,559**	**1,129,222**	**1,271,524**
Agriculture, hunting and forestry	538,264	594,289	681,162	750,109	881,238	839,862	1,027,228	1,168,409
Fishing	108,080	106,091	109,013	98,579	96,777	100,697	101,994	103,115
Non-agriculture	**6,297,555**	**6,885,947**	**7,575,167**	**8,189,087**	**8,681,620**	**8,650,163**	**9,580,592**	**9,848,994**
Mining and quarrying	175,486	222,124	257,607	278,906	315,185	305,700	339,692	366,608
Manufacturing	2,058,746	2,268,623	2,548,507	2,790,778	2,980,979	2,859,089	3,358,410	3,297,910
Electricity, gas and water supply	213,348	222,359	241,130	249,938	265,431	282,870	298,675	304,693
Construction	197,014	226,654	245,217	263,388	266,943	271,297	303,008	281,877
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	1,057,009	1,135,238	1,219,311	1,311,135	1,388,318	1,430,697	1,568,885	1,630,226
Hotels and restaurants	229,937	231,321	255,239	277,778	298,874	285,537	311,346	338,644
Transport, storage and communications	546,587	566,820	620,610	690,709	701,781	701,195	734,884	743,791
Financial intermediation	367,364	417,155	448,643	493,043	523,609	543,844	561,392	640,996
Real estate, renting and business activities	515,545	563,549	620,819	642,703	667,114	642,744	703,633	741,957
Public administration and defence; compulsory social security	393,384	437,976	482,560	530,042	577,397	614,852	652,464	703,436
Education	261,662	289,227	319,071	349,617	372,103	391,702	410,474	435,803
Health and social work	114,850	125,326	135,858	143,781	149,829	152,178	156,987	166,112
Other community, social and personal service activities	158,401	171,043	171,857	158,057	164,375	158,323	170,593	186,207
Private households with employed persons	8,222	8,532	8,738	9,212	9,682	10,135	10,149	10,734
Gross domestic product, (GDP)	**6,943,899**	**7,586,327**	**8,365,342**	**9,037,775**	**9,659,635**	**9,590,722**	**10,709,814**	**11,120,518**
plus : Net primary income from the rest of the wold	-302,148	-341,440	-312,290	-305,508	-313,144	-331,321	-476,313	-344,427
Gross national product, (GNP) 1/	**6,641,751**	**7,244,887**	**8,053,052**	**8,732,267**	**9,346,491**	**9,259,401**	**10,233,501**	**10,776,091**
less : Consumption of fixed capital	1,019,111	1,134,099	1,226,298	1,289,666	1,463,103	1,486,739	1,590,776	1,732,667
Taxes on production and imports less subsidies	699,545	774,442	867,824	895,447	884,048	934,664	1,102,521	1,104,693
National income, (NI) 2/	**4,923,095**	**5,336,346**	**5,958,930**	**6,547,154**	**6,999,340**	**6,837,998**	**7,540,204**	**7,938,731**
Per capita GDP (Baht)	**107,606**	**116,535**	**127,571**	**136,851**	**145,297**	**143,353**	**159,105**	**164,512**
Per capita GNP (Baht)	**102,923**	**111,290**	**122,809**	**132,225**	**140,587**	**138,400**	**152,029**	**159,417**
Per capita NI (Baht)	**76,290**	**81,973**	**90,873**	**99,138**	**105,282**	**102,208**	**112,017**	**117,442**
Population (1,000 Heads)	**64,531**	**65,099**	**65,574**	**66,041**	**66,482**	**66,903**	**67,313**	**67,597**

Note : 1/ GNP = GNI (Gross national income)
2/ NI = NNP (Net national product) at factor cost

GDP subsector - NESDB

Back

Table 12 Gross domestic product originating from manufacturing at current market prices

(Millions of Baht)

	2004	2005	2006	2007	2008r	2009r	2010r	2011p
Food products and beverages	405,111	419,208	485,342	506,315	571,935	616,118	689,359	744,721
Tobacco products	38,894	37,372	38,483	42,420	43,660	48,155	58,202	60,687
Textiles	128,643	129,907	133,486	128,523	129,670	118,808	137,852	123,873
Wearing apparel	114,482	117,652	119,278	98,440	99,760	83,004	99,596	86,060
Leather products and footwear	36,193	38,394	38,852	43,696	41,751	36,263	37,554	38,697
Wood and wood products	23,602	24,362	25,578	30,189	28,562	27,866	31,898	35,610
Paper and paper products	40,335	43,634	47,711	50,013	48,640	47,043	52,865	51,425
Printing and publishing	21,510	23,070	24,146	24,542	25,072	23,499	24,464	25,079
Refined petroleum products	80,061	116,471	176,949	229,831	186,010	198,464	223,926	188,685
Chemicals and chemical products	154,147	180,611	195,944	222,179	234,629	215,755	267,521	268,262
Rubber and plastic products	135,594	155,938	174,747	187,404	204,506	170,615	231,902	255,486
Other non-metallic mineral products	104,068	111,774	117,779	116,823	122,409	118,698	130,197	132,852
Basic metals	72,487	75,075	74,839	76,712	77,067	62,148	66,899	63,499
Fabricated metal products	79,935	80,983	90,096	96,493	103,215	82,705	93,582	96,669
Machinery and equipment	94,479	110,655	122,088	151,412	168,387	147,865	178,217	183,480
Office, accounting and computing machinery	89,244	123,747	164,895	228,262	276,342	281,572	321,994	237,729
Electrical machinery and apparatus	51,233	55,879	61,975	69,384	77,279	79,318	91,130	95,014
Radio, television and communication equipment and apparatus	83,180	97,412	102,340	103,309	98,256	100,877	112,093	102,422
Medical, precision and optical instruments, watches and clocks	24,830	27,846	33,094	36,437	41,888	42,718	49,611	42,288
Motor vehicles	124,133	134,076	149,730	164,460	198,482	155,051	223,876	207,366
Other transport equipment	66,181	74,803	71,127	63,179	74,079	57,181	74,898	85,634
Funiture; manufacturing n.e.c.	89,814	88,893	98,853	119,375	127,653	143,519	158,698	170,076
Recycling	590	861	1,175	1,380	1,727	1,847	2,076	2,296
Total value added	**2,058,746**	**2,268,623**	**2,548,507**	**2,790,778**	**2,980,979**	**2,859,089**	**3,358,410**	**3,297,910**

Industrial Production - OIE

Back

PRODUCTION

* Preliminary Figure

		PRODUCT	UNIT	2008	2009	2010	2011	2012	2013 JAN-JUN*
151110	070	Frozen & chilled meat Chicken	ton	651,665.30	674,149.72	722,108.37	715,505.35	781,689.84	337,506.18
151120	050	Sausage	ton	18,022.19	14,838.14	16,004.56	18,951.56	19,646.99	10,002.08
151120	060	Ham	ton	630.66	605.89	610.42	653.48	754.57	365.87
151120	090	Meat ball Pork	ton	670.57	511.23	530.97	508.01	505.21	249.07
151210	010	Canned fish tuna	ton	414,794.23	421,178.98	438,864.08	420,164.66	460,926.83	250,295.41
151210	020	Canned fish sardine	ton	29,150.72	34,169.43	36,759.87	52,473.24	63,277.12	28,076.16
151220	010	Chilled or frozen seafood prawn&shri	ton	95,310.42	103,143.22	117,936.32	114,575.68	92,319.89	23,792.49
151220	020	Chilled or frozen seafood Fish	ton	52,322.05	49,200.18	51,526.90	59,907.53	60,337.08	30,500.72
151220	030	Chilled or frozen seafood Squid	ton	30,699.13	26,818.39	26,487.71	25,564.61	23,306.14	11,171.98
151310	010	Canned Vegetable Com Young	ton	4,390.86	1,940.77	2,465.15	1,829.42	1,909.50	1,203.95
151310	060	Canned fruit Pineapple	ton	345,691.78	249,835.63	211,640.08	344,690.88	269,817.66	142,690.01
151310	120	Fruit juice	ton	134,642.89	132,039.14	123,628.97	158,539.43	151,664.42	58,644.96
151310	130	Dried fruit&vegetable	ton	25,652.16	24,270.87	26,498.96	21,981.47	22,165.77	10,086.59
151410	010	Soy-bean oil Pure	ton	65,166.90	65,539.84	76,772.30	85,882.26	70,253.26	27,417.86
151410	020	Soy-bean oil Raw	ton	74,921.90	73,219.14	71,981.81	95,305.24	82,040.46	25,301.60
151410	030	Palm oil Pure	ton	620,050.11	543,336.76	587,788.89	700,994.57	772,619.24	392,523.11
151410	040	Palm oil Raw	ton	493,708.56	421,078.59	379,883.63	516,103.24	487,505.58	263,748.31
151410	070	Coconut oil Pure	ton	23,602.74	22,943.59	13,577.98	10,422.93	11,486.06	5,624.29
151410	100	Rice oil Raw	ton	102,537.10	112,660.37	106,678.62	118,527.48	114,785.89	48,711.49
152010	010	Pasteurized milk	ton	175,001.99	169,937.63	195,108.54	220,162.04	250,197.12	144,123.39
152010	060	Ice-cream	ton	63,766.92	64,349.58	76,279.52	79,370.58	94,429.46	52,407.61
153210	010	Tapioca Flour	ton	678,670.51	763,813.96	684,585.56	824,342.17	907,097.31	387,963.51
153310	010	Principle animal Pig	ton	971,673.23	859,087.04	946,523.46	1,070,447.02	1,196,984.71	538,674.79

Industrial Index - OIE

Back

INDICES BY INDUSTRY AND COMMODITY

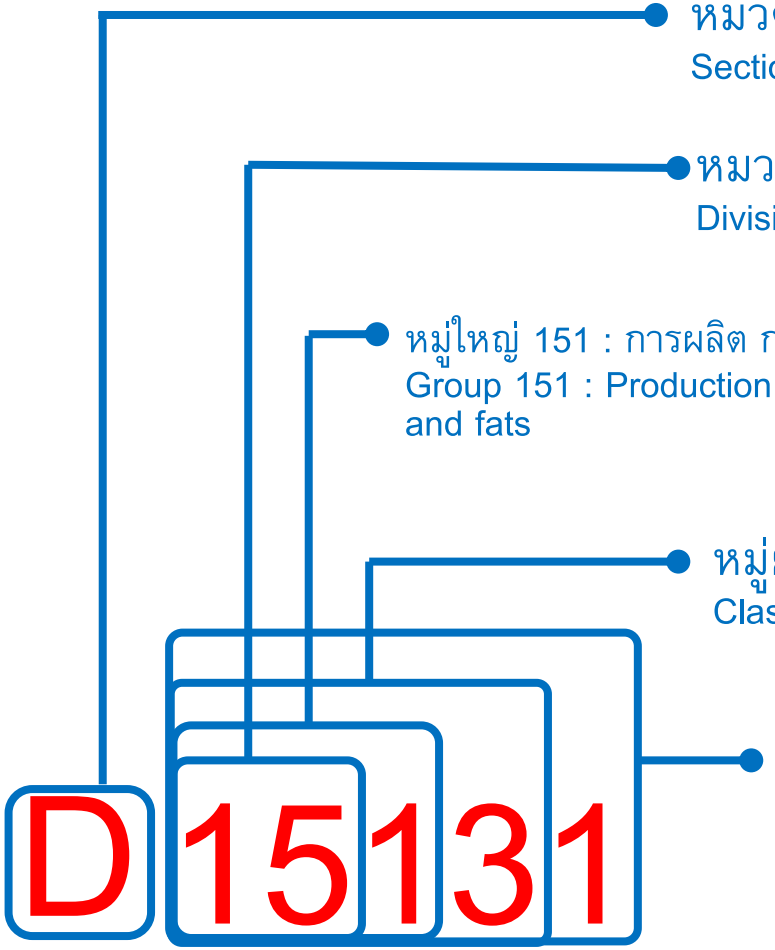
Production Index (Value added Weight)

(Annual average Year 2000 is the base month,Not seasonally adjusted) (*) Preliminary Figure

		Product	Weight 2000	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013 JAN-JUN*
		Integrated Index (Not seasonally adjusted)	100.00	100.00	100.04	109.85	123.89	137.61	149.95	159.48	172.36	179.12	166.29	190.21	173.57	177.94	175.71
		ISIC : 15 Manufacture of food products and be	15.5051705	100.00	102.90	109.36	124.96	121.31	130.13	140.77	145.06	145.48	139.37	145.41	151.02	161.24	162.46
		ISIC 1511: Production of meat and meat produc	1.5123702	100.00	106.05	124.34	148.73	115.42	114.19	120.77	116.17	116.87	119.31	127.69	127.57	138.95	121.14
		Q : 151110 Frozen & Chilled Meat Chicken	1.4277362	100.00	104.80	122.08	146.90	111.22	111.60	119.10	115.02	115.89	119.89	128.42	127.25	139.02	120.05
151110	070	Frozen & chilled meat Chicken	1.4277362	100.00	104.80	122.08	146.90	111.22	111.60	119.10	115.02	115.89	119.89	128.42	127.25	139.02	120.05
		Q : 151120 Sausage Ham Bacon etc.	0.0846340	100.00	127.16	162.53	179.68	186.27	157.88	148.85	135.52	133.25	109.39	115.34	133.04	137.87	139.64
151120	050	Sausage	0.0620140	100.00	139.26	186.76	213.36	223.71	188.15	176.67	160.61	157.44	129.63	139.82	165.56	171.64	174.76
151120	060	Ham	0.0048140	100.00	62.33	74.94	78.41	86.59	73.42	72.61	71.45	72.93	70.07	70.59	75.57	87.26	84.62
151120	070	Bacon	0.0010389	100.00	111.37	135.96	139.68	147.02	130.33	197.93	206.90	265.51	300.76	317.19	259.40	249.88	245.54
151120	080	Meat ball Chicken	0.0142255	100.00	105.66	99.99	88.19	79.52	73.49	63.08	46.58	42.43	24.88	13.86	10.20	9.21	7.58
151120	090	Meat ball Pork	0.0025416	100.00	81.67	98.22	78.05	75.09	62.90	74.25	113.40	111.42	84.95	88.23	84.41	83.95	82.77
		ISIC 1512: Processing and preserving of fish and	3.7171706	100.00	113.05	111.75	118.84	110.16	143.85	148.46	142.93	141.47	147.32	162.56	159.90	145.25	109.21
		Q : 151210 Canned Fish,Canned Seafood	0.7263048	100.00	129.86	147.33	168.11	166.46	215.30	228.68	200.80	217.19	222.34	232.13	229.06	253.54	270.40
151210	010	Canned fish tuna	0.6023435	100.00	143.24	164.64	190.31	187.20	245.88	260.65	224.33	248.01	251.82	262.40	251.22	275.59	299.30
151210	020	Canned fish sardine	0.1239612	100.00	64.83	63.22	60.22	65.71	66.69	73.38	86.50	67.45	79.06	85.06	121.42	146.42	129.93
		Q : 151220 Fish and Seafood Products	2.9908658	100.00	108.96	103.11	106.87	96.49	126.50	128.97	128.88	123.09	129.10	145.67	143.10	118.95	70.07
151220	010	Chilled or frozen seafood prawn&shrimp	2.3317182	100.00	110.77	101.28	105.84	93.06	132.36	137.87	138.65	131.22	142.01	162.37	157.75	127.10	65.51
151220	020	Chilled or frozen seafood Fish	0.2033052	100.00	92.66	101.08	112.44	115.89	112.51	102.59	105.16	116.57	109.61	114.79	133.46	134.42	135.90
151220	030	Chilled or frozen seafood Squid	0.2552808	100.00	116.82	124.81	121.74	127.51	120.41	116.86	110.92	100.76	88.02	86.94	83.91	76.50	73.34
151220	050	Ground fish	0.2005616	100.00	94.51	98.72	94.30	77.22	80.34	67.76	62.18	63.54	51.09	57.51	57.94	62.48	52.10
		ISIC 1513: Processing of fruit and vegetables	0.5331170	100.00	95.70	103.27	116.80	111.19	105.10	114.96	106.12	119.18	98.48	92.61	118.24	103.44	97.89
		Q : 151310 Canned Fruit and Vetgetable	0.5331170	100.00	95.70	103.27	116.80	111.19	105.10	114.96	106.12	119.18	98.48	92.61	118.24	103.44	97.89
151310	010	Canned Vegetable Com Young	0.0389690	100.00	115.80	100.91	109.15	107.22	73.28	54.63	44.32	25.47	11.26	14.30	10.61	11.08	13.97
151310	060	Canned fruit Pineapple	0.2982725	100.00	70.33	63.07	91.11	86.96	82.01	92.75	82.26	113.60	82.10	69.55	113.27	88.67	93.78
151310	120	Fruit juice	0.0979346	100.00	83.90	156.78	134.18	114.72	137.20	174.65	148.68	136.36	133.72	125.20	160.56	153.60	118.78
151310	130	Dried fruit&vegetable	0.0979409	100.00	176.76	173.10	180.69	183.05	155.98	146.93	160.82	156.27	147.86	161.43	133.91	135.03	122.89

How to read TSIC 2515 (1972)

How to read TSIC 2544 (2001)



หมวดใหญ่ D : การผลิต
Section D : Manufacturing

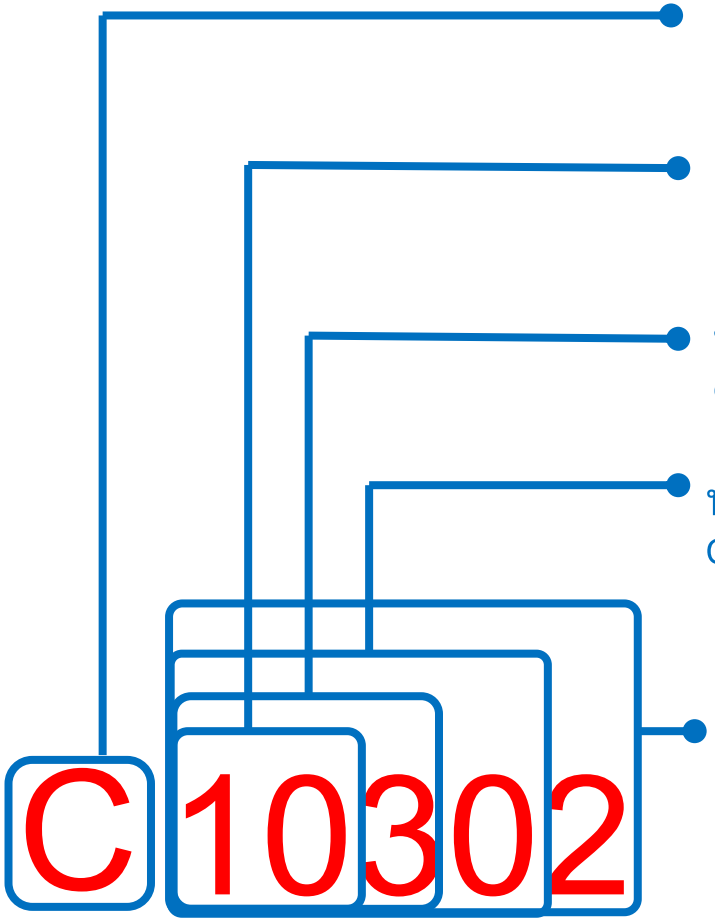
หมวดย่อย 15 : การผลิตผลิตภัณฑ์อาหารและเครื่องดื่ม
Division 15 : Manufacture of Food and Beverages

หมู่ใหญ่ 151 : การผลิต การแปรรูป และเก็บถนอมเนื้อสัตว์ ปลา ผลไม้ ผัก น้ำมัน และไขมัน
Group 151 : Production, processing and preservation of meat, fish, fruit, vegetables, oils and fats

หมู่ย่อย 1513 : การแปรรูปและการเก็บถนอมผลไม้และผัก
Class 1513 : Processing and preserving of fruit and vegetables

ตัวอุตสาหกรรม 15131 : การผลิตผลิตภัณฑ์ผลไม้กระป๋องและผักกระป๋อง
Industry 15131 : Canning of fruits and vegetables

How to read TSIC 2552 (2009)



หมวดใหญ่ C : การผลิต
Section C : Manufacturing

หมวดย่อย 10 : การผลิตผลิตภัณฑ์อาหาร
Division 10 : Manufacture of Food and Beverages

หมู่ใหญ่ 103 : การแปรรูปและการถนอมผลไม้และผัก
Group 103 : Processing and preserving of fruit and vegetables

หมู่ย่อย 1030 : การแปรรูปและการถนอมผลไม้และผัก
Class 1030 : Processing and preserving of fruit and vegetables

ตัวอุตสาหกรรม 10302 : การผลิตผลไม้และผักบรรจุกระป๋อง
Industry 10302 : Canning of fruits and vegetables