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

Energy Policy and Planning Office
MINISTRY OF ENERGY

Enerdata

Final Results of Energy Data Analysis Phase 2:
Energy Efficiency Indicators Development
Organised by EPPO and GIZ on behalf of Thai-German Programme
21st August 2014, Bangkok

Energy efficiency trends in service sector buildings

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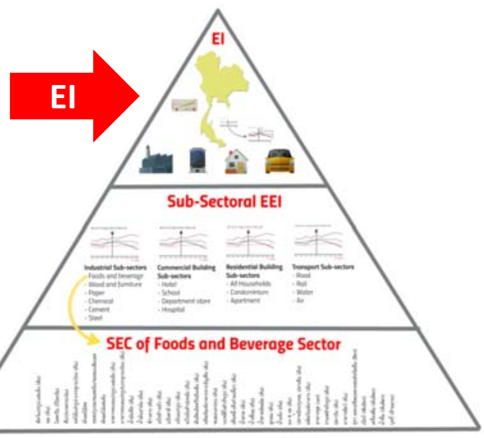
Prepared with the support of GIZ

Outline

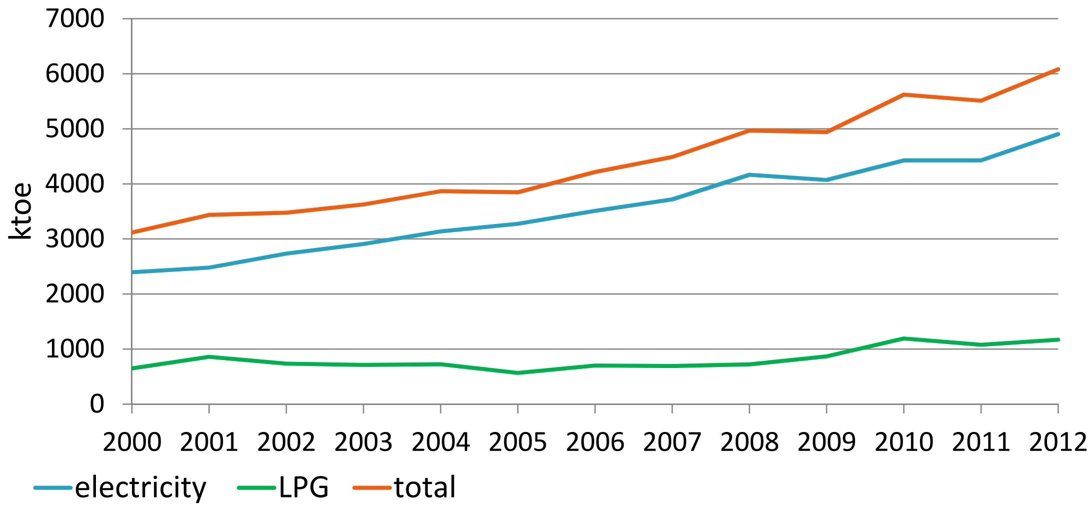
- **1. Overall trends**
- 2. Indicators by sub-sector



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

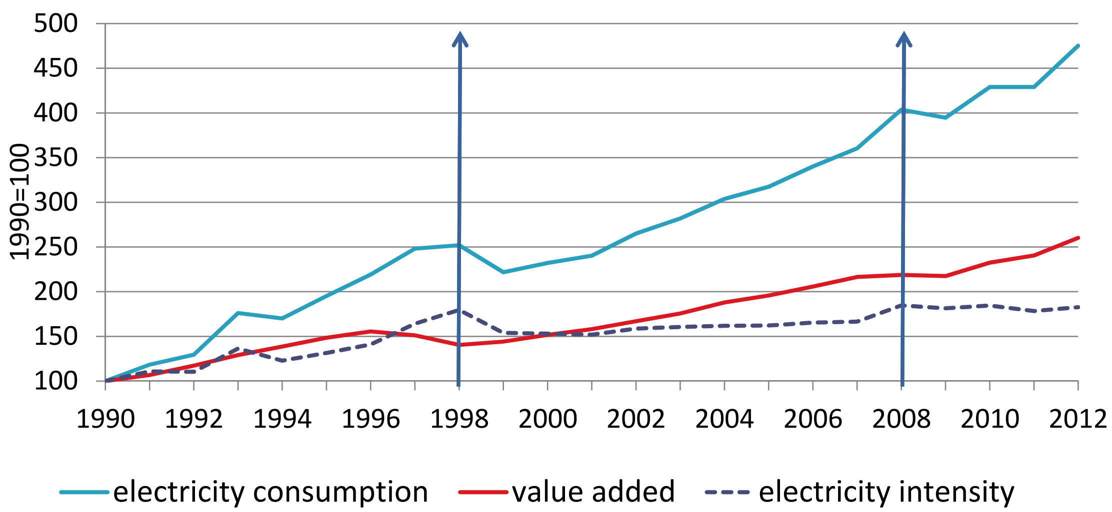


Enerdata Sources: DEDE;

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

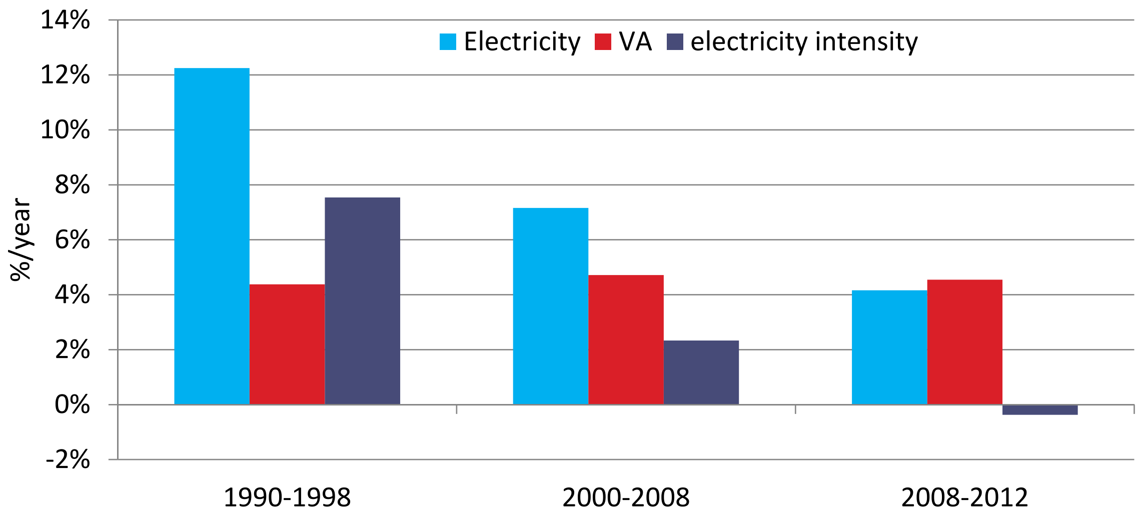


Enerdata Sources: energy consumption: DEDE; value added: NESDB

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

Trends in the electricity intensity of services in Thailand



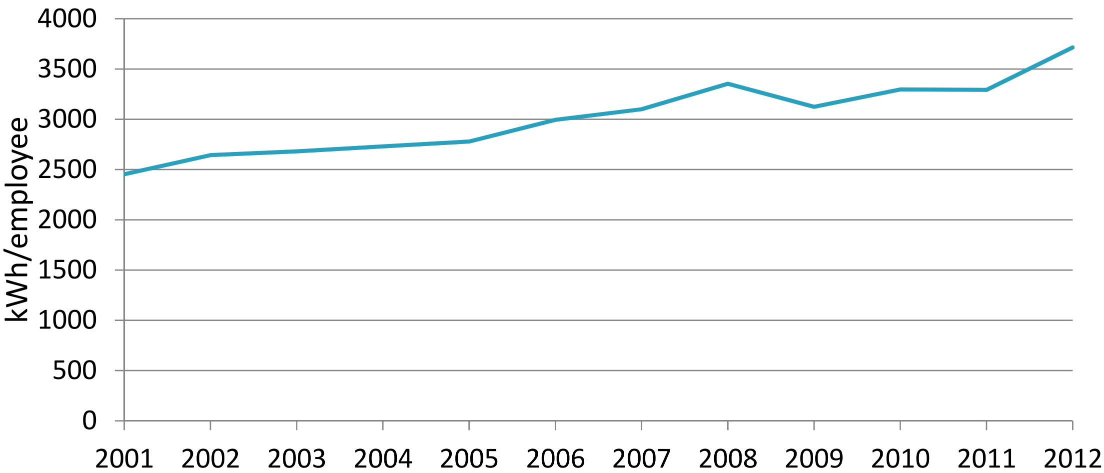
Specific electricity consumption per employee

- An alternative indicator is the specific electricity consumption per employee, that relates the electricity consumption of the service sector (in GWh) to the employment and is measured in kWh per employee;
- This indicator is more interesting for assessing energy efficiency trends than the electricity intensity as the electricity consumption is related directly to the number of employees for some end-uses (case of ICTs, Information and Communication Technologies) and is linked for others (case of AC and lighting) to the floor area, thus somehow to the number of employees, as the ratio m2/employee are changing slowly.
- As it is measured in physical units comparison it is more relevant for cross countries comparisons, however with countries with similar labour productivity profile;

Electricity consumption per employee in services

- Electricity consumption per employee has increased rapidly until 2008; by 4%/year on average and has stopped increasing since then.
- This rapid progression until 2008 is due to increased comfort (air conditioning) and the diffusion of ICT's (Information and Communication Technologies);
- The relative stabilization since 2008 is not linked to a slow down of economic activity and may be linked to energy efficiency.

Electricity consumption per employee in services in Thailand



Sources: electricity consumption: DEDE; employment: NESDB

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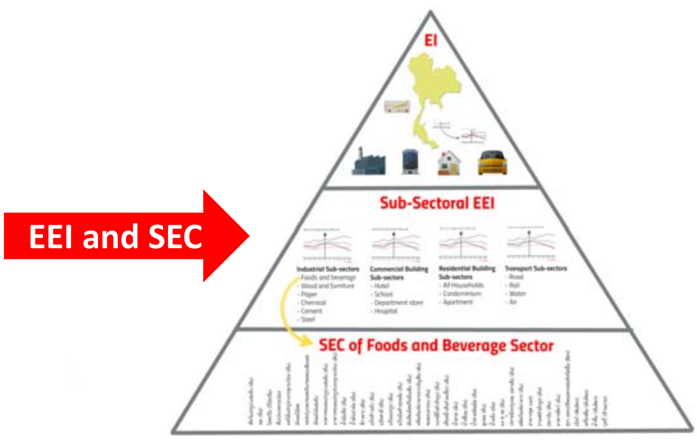
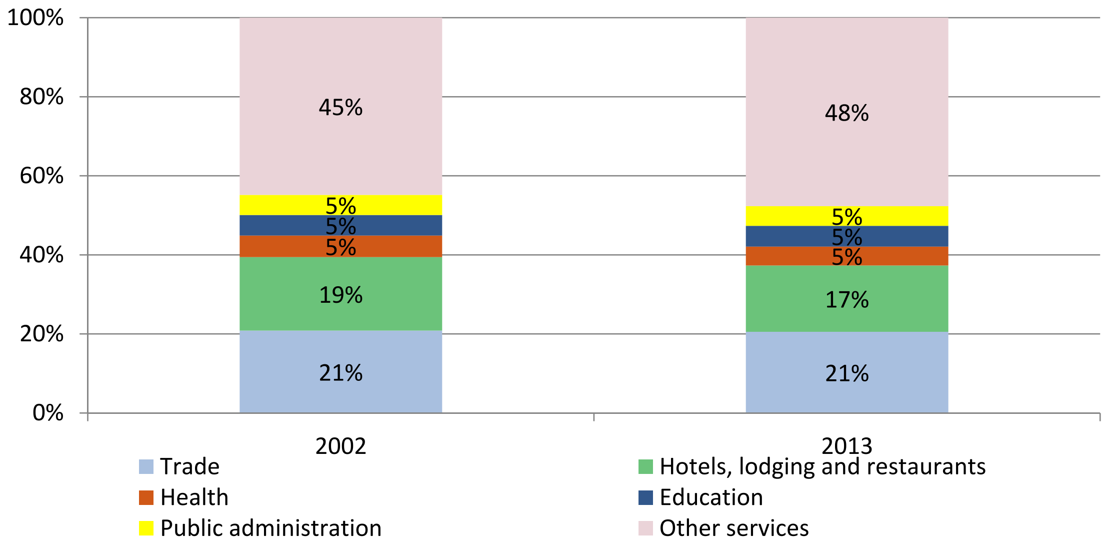


Electricity consumption by sub-sector in services

•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

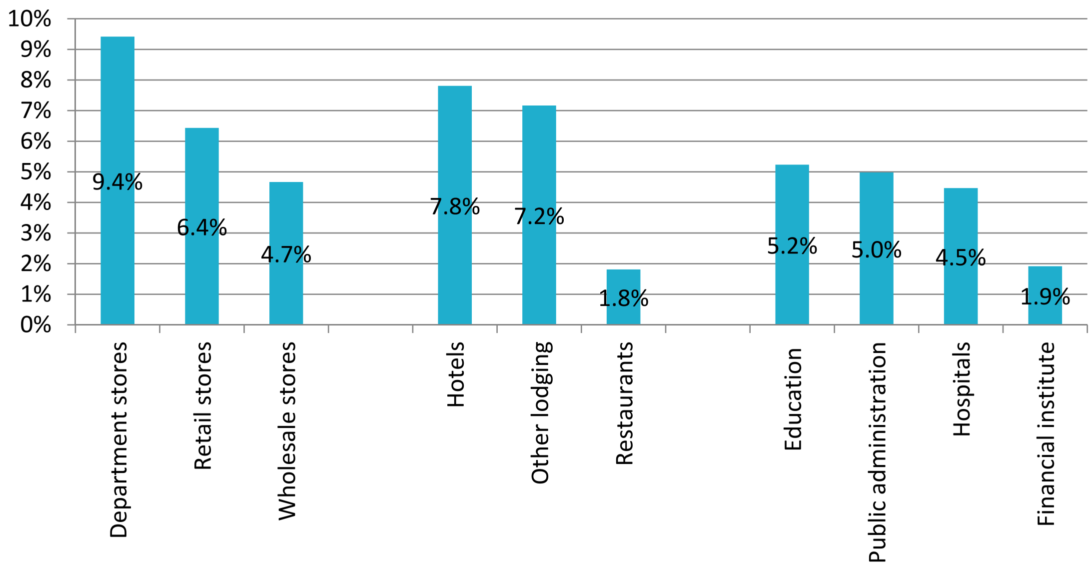


Enerdata Source: EPPO

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)



Enerdata 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 m²** for some buildings types based on data from designated buildings; however they will not be shown here as they are being finalized by DEDE.

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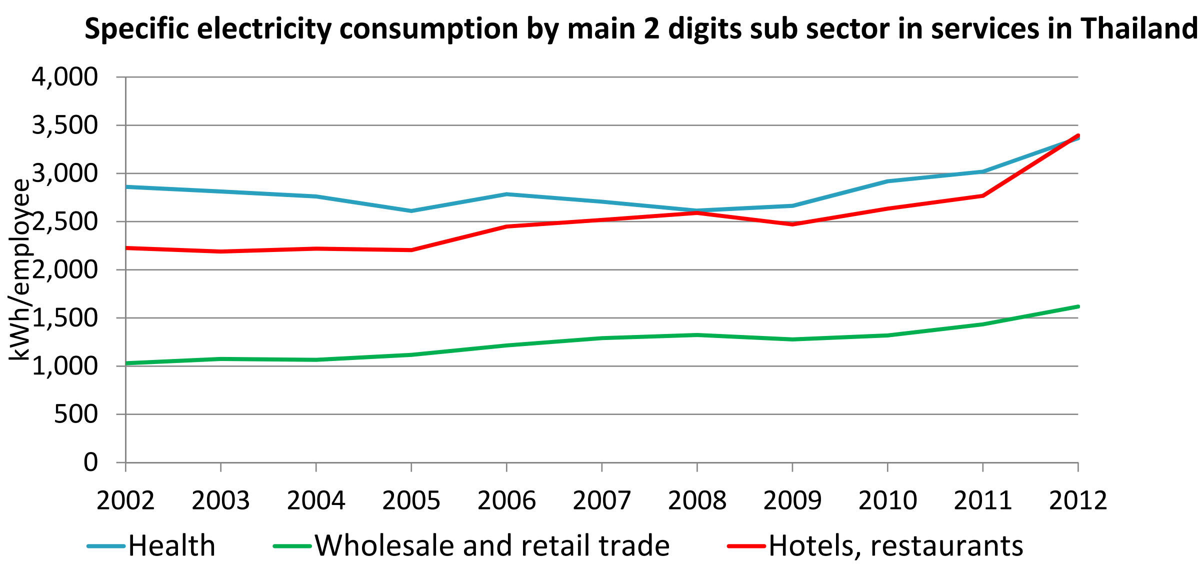
Specific electricity consumption by main sub-sector in services

- 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)



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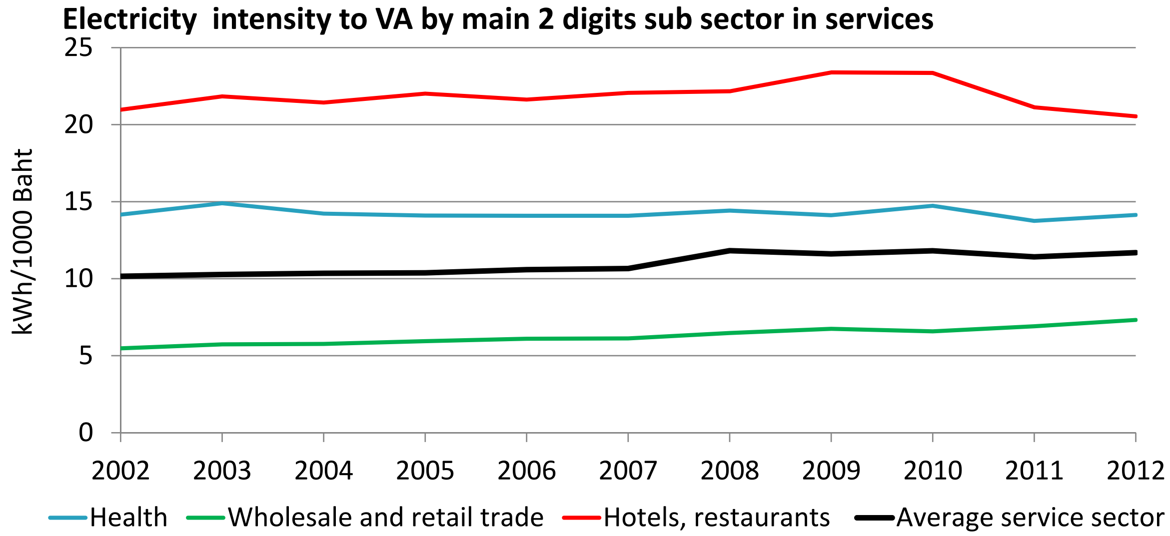
Sources: EPPO; wholesale and retail trade includes department stores;

Specific electricity consumption by main sub-sector in services

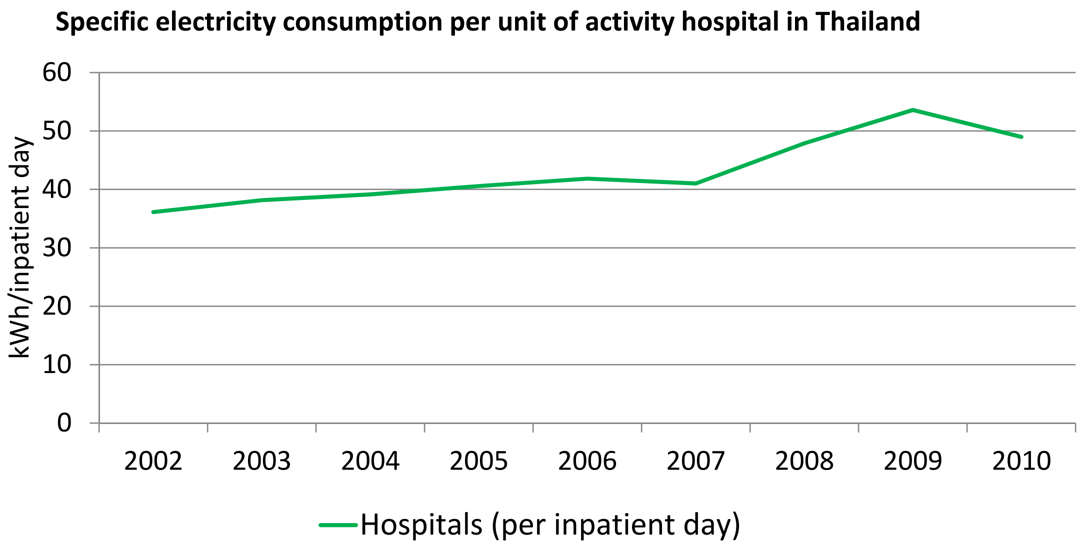
- Hotels/restaurants is the most intensive sub–sectors: it uses twice more electricity than the average of the sector to generate one Baht of value added and 3 times more than wholesale and retail trade;
- Its intensity has been decreasing since 2010 while that of trade is regularly growing.
- The share 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;

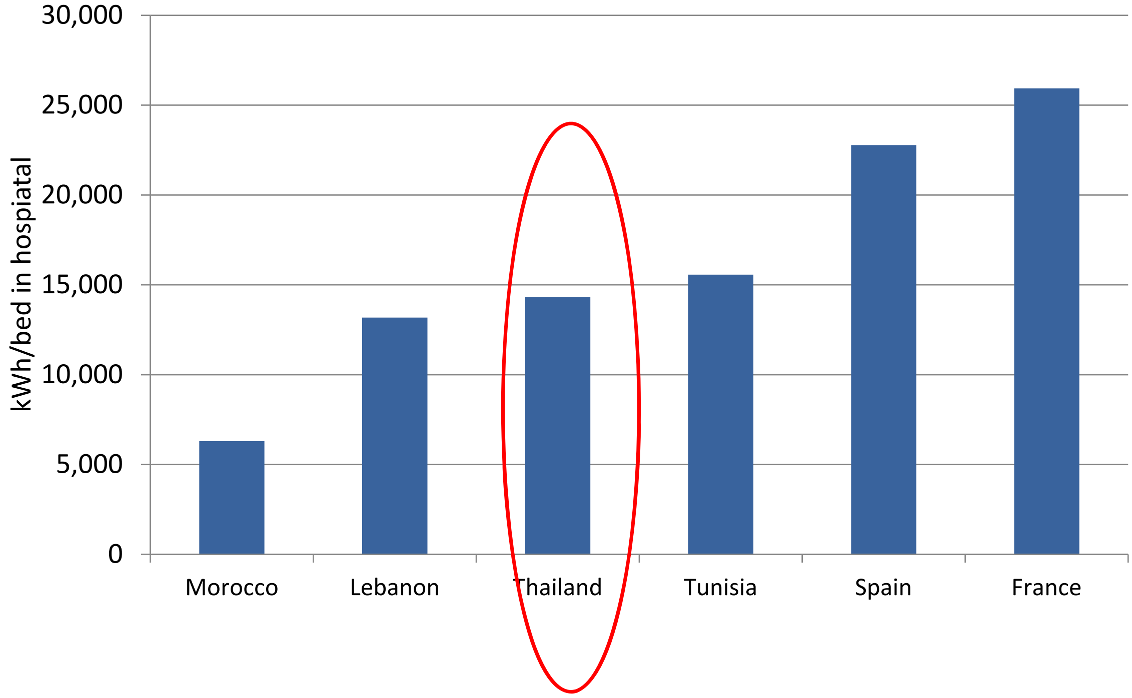
Specific electricity consumption per unit of activity in selected buildings

Specific consumption is slightly progressing for hospitals.



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

Comparison of specific electricity consumption per bed in hospitals : Thailand vs Mediterranean countries (2010)



Source: Mediterranean countries: http://medener-indicateurs.net/uk/datamapper/
Thailand: 2002; source EPPO for electricity consumption

Conclusions

- It is difficult to show energy efficiency improvements for the different types of buildings or sub-sectors considered as the indicators do not separe the end-uses and tend to increase because of increased comfort (AC) and increased number of ICT’s.

- Comparison of indicators of specific energy consumption per employee is possible as such indicators are often available but such comparisons may be misleading, especially if the comparison is done with OECD countries where the level of service and thus the number of employees per activity is much lower than in emerging countries.

- Comparisons are more relevant for indicators based on m2 or level of activities (number of beds, person night...) .

- Some adaptations of data are still necessary to well separate households and services (case of apartments and condominiums)