Co-funded by the European Union

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Proposal number: 101120572

Proposal acronym: EE4HORECA

Proposal title: Supporting the Clean Energy Transition of the HORECA value chain

Deliverable 3.6 Benchmarking self-assessment tool

Co-funded by the European Union

Summary

INTRODUCTION

The EE4HORECA project brings together 12 partners from 7 countries and focuses on the value chain approach to test and validate the economic viability of collaborative models in greening value chains and to propose benchmarks and standards inputting regulatory and policy improvements. All the activities are focused on supporting companies and staff in the implementation of energy efficiency measures, business models, and benchmarks for greening the HORECA value chain.

The project focuses its activities in the following NACE sectors: accommodation and food service activities (NACE Code: I55 to I56.3.0)

The present work is part of the WP3 that will propose business models and benchmarking for improving the sustainability of the value chain of the HORECA sector.

The overall objectives of the present WP aim to:

- Assess the relevant resource flows of the supply chain and define best practices to improve their sustainability.
- Develop an integrated economic model through a life cycle perspective with considerations of the non-energy benefits.
- Evaluate the untapped potential of energy efficiency and renewable at each step of the value chain once gathered data directly from the supply chain investigated.
- Create a benchmarking tool focused on energy use at the value chain level.

The present report shows the benchmarking self-assessment tools developed under WP3.

The present work is Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

INFO

Supporting the Clean Energy Transition of the HORECA value chain (EE4HORECA project)

#1: Value chain model: Info

This tool deals with the energy requirement along value chains of the HORECA sector.

Language: English (EN)

Important note: Please chose your language prior to adding any data to the empty tool and do not change the language therelater. Otherwise, issues may occur due to drop-down fields that do not update automatically update to the new language setting.

Version: 1.0

Aim: The aim of this model is to understand and help minimize the overall specific energy consumption along value chains. For this purpose, it allows to analyse (i) energy requirement in HORECA activities, (ii) energy requirements in transport activities, and (iii) energy requirements of the main suppliers.

Target group: Supply chain managers & environmental managers

Color coding:

Field is an input field and requires input the user.

Information transferred from a different part of the workbook.
Information calculated based on other values.

Acknowledgements: The EE4HORECA project team gratefully acknowledges the support by its sister project ICCEE

INPUT

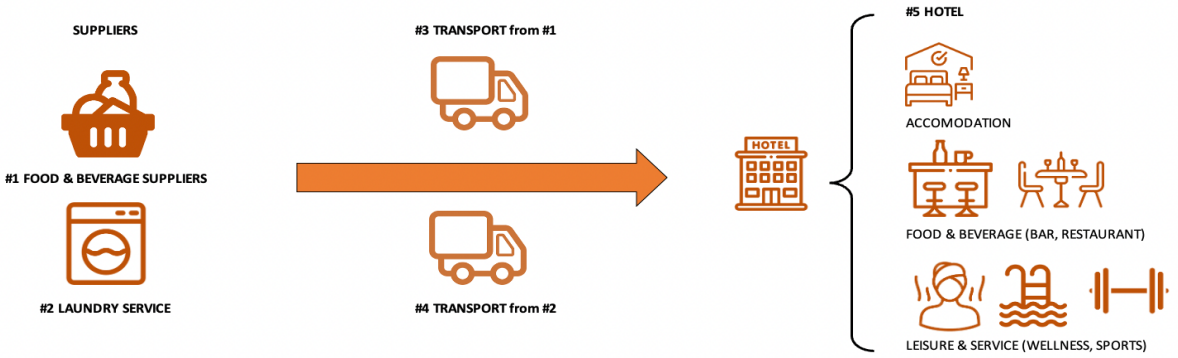
Hotel Value Chain

Supporting the Clean Energy Transition of the HORECA value chain (EE4HORECA project)

#1: Value chain model: Input data

The value chain is the series of processes involved in the supply of HORECA services, from when raw materials are firstly made until final services are offered to the guests. These processes are managed by a set of companies operating with different purposes and at different stages, thus creating a network.

This value chain consists of three stages, i.e., suppliers, transportation and HORECA activities.



Your own value chain may look different. In that case, you may omit or aggregate input of some stages to match your own chain. If you need a more differentiated view, please use a separate workbook.

#1: Food and Beverage supplier		
Demand rate of fresh food and beverage (0/4°C)		[kg/year]
Demand rate of frozen food and beverage (-18/0°C)		[kg/year]
Demand rate of food and beverage at ambient temperature		[kg/year]
Ambient temperature (average value in the hottest season)		[°C]
Reference warehouse temperature (Fresh)		[°C]
Reference warehouse temperature (Frozen)		[°C]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m³/year]
Annual gasoil consumption		[l/year]
Storage size		[m³]
Production rate		[kg/year]
Average warehouse utilisation (material volume/storage size)		[%]
Average storage time at the warehouse		[h]
ENERGY CONSUMPTION SHARE		
Refrigeration		
Processing		
Lighting		
HVAC		
Other		
	#DIV/0!	[kg/guest night]

#2: Laundry service		
Demand rate of laundry services		[kg/year]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m³/year]
Annual gasoil consumption		[l/year]
Average warehouse utilisation (material volume/storage size)		
Average storage time at the warehouse		[h]
ENERGY CONSUMPTION SHARE		
Processing		
Hot Water		
Lighting		
HVAC		
Other		

#3: Transport from stage #1		
Fresh products		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Travel time requiring refrigeration (average)		[h]
Distance travelled per lt of fuel		[km/l]; [km/kWh]
Electrical power		[kW]
Payload		[kg]
Average number of trip per year		
Frozen products		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Travel time requiring refrigeration (average)		[h]
Distance travelled per lt of fuel		[km/l]; [km/kWh]
Electrical power		[kW]
Payload		[kg]
Average number of trip per year		
Products at ambient temperature		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Distance travelled per lt of fuel		[km/l]; [km/kWh]
Payload		[kg]
Average number of trip per year		
Transport saturation	#DIV/0!	

#4: Transport from stage #2		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Distance travelled per lt of fuel		[km/l]; [km/kWh]
Payload		[kg]
Average number of trip per year		
Transport saturation	#DIV/0!	

#5: Hotel		
Hotel rating (1-5)		
Guests night per year		[guest nights/year]
Total number of rooms		
Average occupancy rate (Number of rooms occupied/total number of rooms)		Low Season
		High Season
INTERNAL SERVICES		
Laundry and Cleaning		
Bar		
Restaurant		
SPA		
Gym		
Pool		
Tennis/Golf court		
Kitchenette in room		
Ambient temperature (average value in the coldest season)		[°C]
Ambient temperature (average value in the hottest season)		[°C]
Reference room temperature (Winter)		[°C]
Reference room temperature (Summer)		[°C]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m^3/year]
Annual gasoil consumption		[l/year]

ENERGY CONSUMPTION SHARE	
HVAC	
Hot Water	
Lighting	
Cooking	
Room loads	
Other	

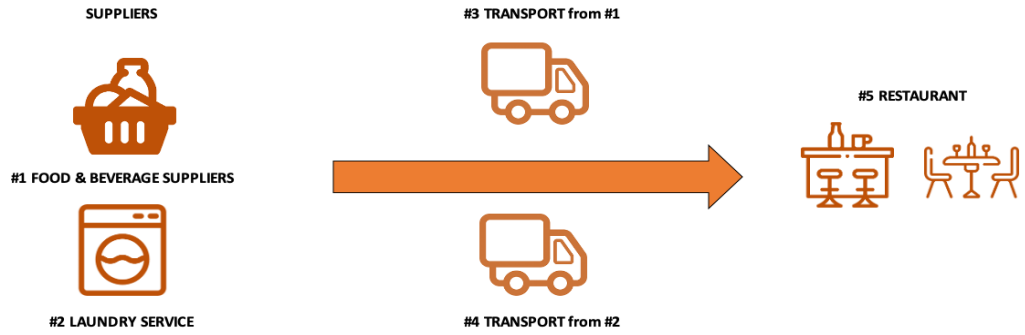
Restaurant Value Chain

Supporting the Clean Energy Transition of the HORECA value chain (EE4HORECA project)

#1: Value chain model: Input data

The value chain is the series of processes involved in the supply of HORECA services, from when raw materials are firstly made until final services are offered to the guests. These processes are managed by a set of companies operating with different purposes and at different stages, thus creating a network.

This value chain consists of three stages, i.e., suppliers, transportation and HORECA activities.



Your own value chain may look different. In that case, you may omit or aggregate input of some stages to match your own chain. If you need a more differentiated view, please use a separate workbook.

#1: Food and Beverage supplier		
Demand rate of fresh food and beverage (0/4°C)		[kg/year]
Demand rate of frozen food and beverage (-18/0°C)		[kg/year]
Demand rate of food and beverage at ambient temperature		[kg/year]
Ambient temperature (average value in the hottest season)		[°C]
Reference warehouse temperature (Fresh)		[°C]
Reference warehouse temperature (Frozen)		[°C]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m³/year]
Annual gasoil consumption		[l/year]
Storage size		[m³]
Production rate		[kg/year]
Average warehouse utilisation (material volume/storage size)		[%]
Average storage time at the warehouse		[h]
ENERGY CONSUMPTION SHARE		
Refrigeration		
Processing		
Lighting		
HVAC		
Other		
	#DIV/0!	[kg/food covers]

#2: Laundry service		
Demand rate of laundry services		[kg/year]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m³/year]
Annual gasoil consumption		[l/year]
Average warehouse utilisation (material volume/storage size)		
Average storage time at the warehouse		[h]
ENERGY CONSUMPTION SHARE		
Processing		
Hot Water		
Lighting		
HVAC		
Other		

#3: Transport from stage #1		
Fresh products		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Travel time requiring refrigeration (average)		[h]
Distance travelled per lt of fuel		[km/l]
Electrical power		[kW]
Payload		[kg]
Average number of trip per year		
Frozen products		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Travel time requiring refrigeration (average)		[h]
Distance travelled per lt of fuel		[km/l]
Electrical power		[kW]
Payload		[kg]
Average number of trip per year		
Products at ambient temperature		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Distance travelled per lt of fuel		[km/l]; [km/kWh]
Payload		[kg]
Average number of trip per year		
Transport saturation	#DIV/0!	

#4: Transport from stage #2		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Distance travelled per lt of fuel		[km/l]
Payload		[kg]
Average number of trip per year		
Transport saturation	#DIV/0!	

#5: Restaurant		
Food covers per year		[food covers/year]
Total number of tables		
Average occupancy rate (Number of tables occupied/total number of tables)		
INTERNAL SERVICES		
Laundry and Cleaning		
Bar		
Ambient temperature (average value in the coldest season)		[°C]
Ambient temperature (average value in the hottest season)		[°C]
Reference inside temperature (Winter)		[°C]
Reference inside temperature (Summer)		[°C]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m^3/year]
Annual gasoil consumption		[l/year]
ENERGY CONSUMPTION SHARE		
HVAC		
Hot Water		
Lighting		
Cooking		
Refrigeration		
Other		

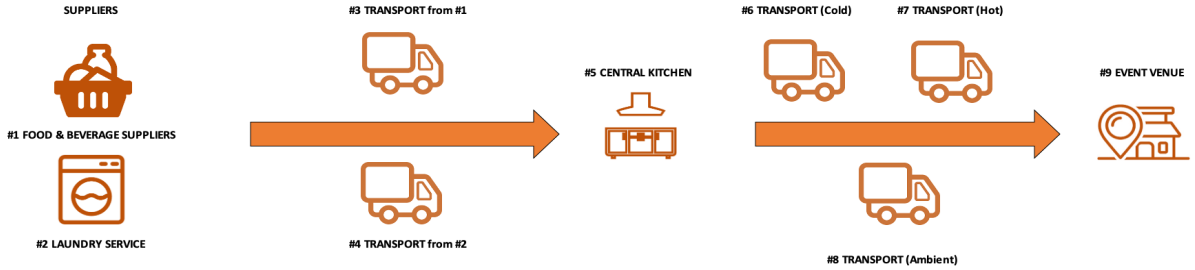
Catering Service Value Chain

Supporting the Clean Energy Transition of the HORECA value chain (EE4HORECA project)

#1: Value chain model: Input data

The value chain is the series of processes involved in the supply of HORECA services, from when raw materials are firstly made until final services are offered to the guests. These processes are managed by a set of companies operating with different purposes and at different stages, thus creating a network.

This value chain consists of three stages, i.e., suppliers, transportation and HORECA activities.



Your own value chain may look different. In that case, you may omit or aggregate input of some stages to match your own chain. If you need a more differentiated view, please use a separate workbook.

#1: Food and Beverage supplier		
Demand rate of fresh food and beverage (0/4°C)		[kg/year]
Demand rate of frozen food and beverage (-18/0°C)		[kg/year]
Demand rate of food and beverage at ambient temperature		[kg/year]
Ambient temperature (average value in the hottest season)		[°C]
Reference warehouse temperature (Fresh)		[°C]
Reference warehouse temperature (Frozen)		[°C]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m³/year]
Annual gasoil consumption		[l/year]
Storage size		[m³]
Production rate		[kg/year]
Average warehouse utilisation (material volume/storage size)		[%]
Average storage time at the warehouse		[h]
ENERGY CONSUMPTION SHARE		
Refrigeration		
Processing		
Lighting		
HVAC		
Other		
	#DIV/0!	[kg/food covers]

#2: Laundry service		
Demand rate of laundry services		[kg/year]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m³/year]
Annual gasoil consumption		[l/year]
Average warehouse utilisation (material volume/storage size)		
Average storage time at the warehouse		[h]
ENERGY CONSUMPTION SHARE		
Processing		
Hot Water		
Lighting		
HVAC		
Other		

#3: Transport from stage #1		
Fresh products		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Travel time requiring refrigeration (average)		[h]
Distance travelled per lt of fuel		[km/l]
Electrical power		[kW]
Payload		[kg]
Average number of trip per year		
Frozen products		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Travel time requiring refrigeration (average)		[h]
Distance travelled per lt of fuel		[km/l]
Electrical power		[kW]
Payload		[kg]
Average number of trip per year		
Products at ambient temperature		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Distance travelled per lt of fuel		[km/l]; [km/kWh]
Payload		[kg]
Average number of trip per year		
Transport saturation		

#4: Transport from stage #2		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Distance travelled per lt of fuel		[km/l]
Payload		[kg]
Average number of trip per year		
Transport saturation	#DIV/0!	

#5: Central Kitchen		
Demand of fresh product		[kg/year]
Demand of hot product		[kg/year]
Demand of products at ambient temperature		[kg/year]
INTERNAL SERVICES		
Laundry and Cleaning		
Ambient temperature (average value in the coldest season)		[°C]
Ambient temperature (average value in the hottest season)		[°C]
Reference inside temperature (Winter)		[°C]
Reference inside temperature (Summer)		[°C]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m^3/year]
Annual gasoil consumption		[l/year]
Storage size		[m^3]
Production rate		[kg/year]
Average warehouse utilisation (material volume/storage size)		[%]
Average storage time at the warehouse		[h]
ENERGY CONSUMPTION SHARE		
HVAC		
Hot Water		
Lighting		

Cooking		
Refrigeration		
Other		
	#DIV/0!	[kg/food covers]

#6: Transport to the event venue (Fresh product)		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Travel time requiring refrigeration (average)		[h]
Distance travelled per lt of fuel		[km/l]
Electrical power		[kW]
Payload		[kg]
Average number of trip per year		

#7: Transport to the event venue (Hot product)		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Travel time requiring heat (average)		[h]
Distance travelled per lt of fuel		[km/l]
Electrical power		[kW]
Payload		[kg]
Average number of trip per year		

#8: Transport to the event venue (Pproduct at ambient temperature)		
Vehicle		
Fuel type		
Travel type		
Average distance - roundtrip		[km]
Distance travelled per lt of fuel		[km/l]
Payload		[kg]
Average number of trip per year		

#9: Event Venue		
Food covers per year		[food covers/year]
Ambient temperature (average value in the coldest season)		[°C]
Ambient temperature (average value in the hottest season)		[°C]
Reference inside temperature (Winter)		[°C]
Reference inside temperature (Summer)		[°C]
Annual electrical energy consumption		[kWh/year]
Annual natural gas consumption		[m^3/year]
Annual gasoil consumption		[l/year]

ENERGY CONSUMPTION SHARE		
HVAC		
Hot Water		
Lighting		
Cooking		
Refrigeration		
Other		

RESULTS

Supporting the Clean Energy Transition of the HORECA value chain (EE4HORECA project)

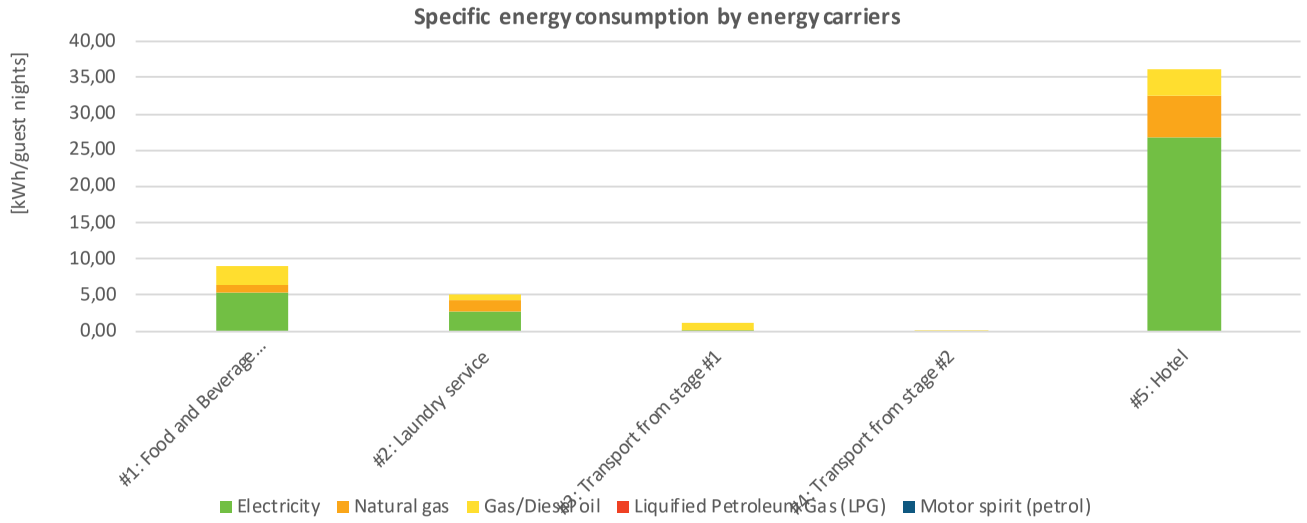
#1: Value chain model: Results

In this sheet the results of the value chain model applied to the input data are reported in terms of specific energy consumption (SEC) by energy carrier.

These results are reported for each stage of the chain. This allows the identification of stages with the highest energy consumption.

This information can serve as a basis to support decision makers in the prioritization of the energy efficiency measures to reduce the overall enery

Specific energy consumption per stage	Specific energy consumption by energy carriers [kWh/guest nights]						Specific economic impact (EU-mix)	Specific environmental impact (EU-mix)
	Electricity	Natural gas	Gas/Diesel oil	Liquified Petroleum Gas (LPG)	Motor spirit (petrol)	**Total**	**€/guest night**	**kg CO2/guest night**
#1: Food and Beverage supplier	5,333	1,078	2,725	0,000	0,000	**9,136**	**1,542**	**2,386**
#2: Laundry service	2,667	1,724	0,727	0,000	0,000	**5,117**	**0,758**	**1,291**
#3: Transport from stage #1	0,173	0,000	1,039	0,000	0,000	**1,212**	**0,188**	**0,279**
#4: Transport from stage #2	0,000	0,000	0,270	0,000	0,000	**0,270**	**0,040**	**0,059**
#5: Hotel	26,667	5,747	3,633	0,000	0,000	**36,047**	**6,261**	**9,813**
Total	**34,840**	**8,549**	**8,394**	**0,000**	**0,000**	51,783	**8,788**	**13,828**



BENCHMARKING