In Plant Assessment at Silva Hotel, Busteni

Silva Hotel

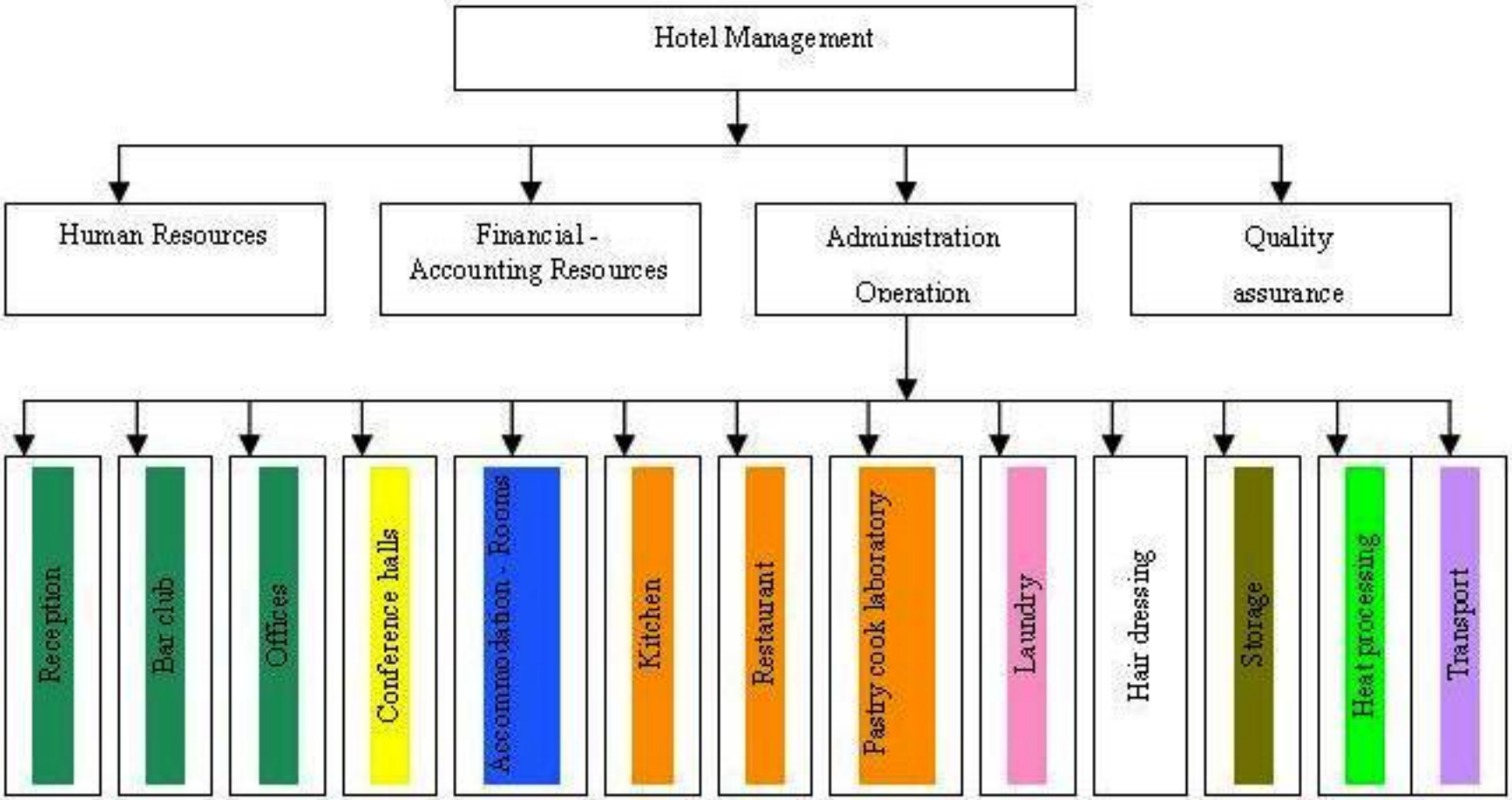
CP In Plant Assessment

- pre-assessment, when the unit CP team was appointed and the audit focus defined;
- elaboration of key performance indicators-KPI;
- material and energy flow analysis;
- generation of CP options and estimation of their economic and environmental benefits.

CP team

Name	Position
Aurel Frigioiu	Quality Manager
Cornelia Popa	Head of Silva Hotel
Marius Penciulescu	Technical Manager
Marius Seceleanu	Marketing Manager
Sanda Ionescu	Human Resources
Cristian Neculai	CP consultant
Lucian Constantin	CP consultant

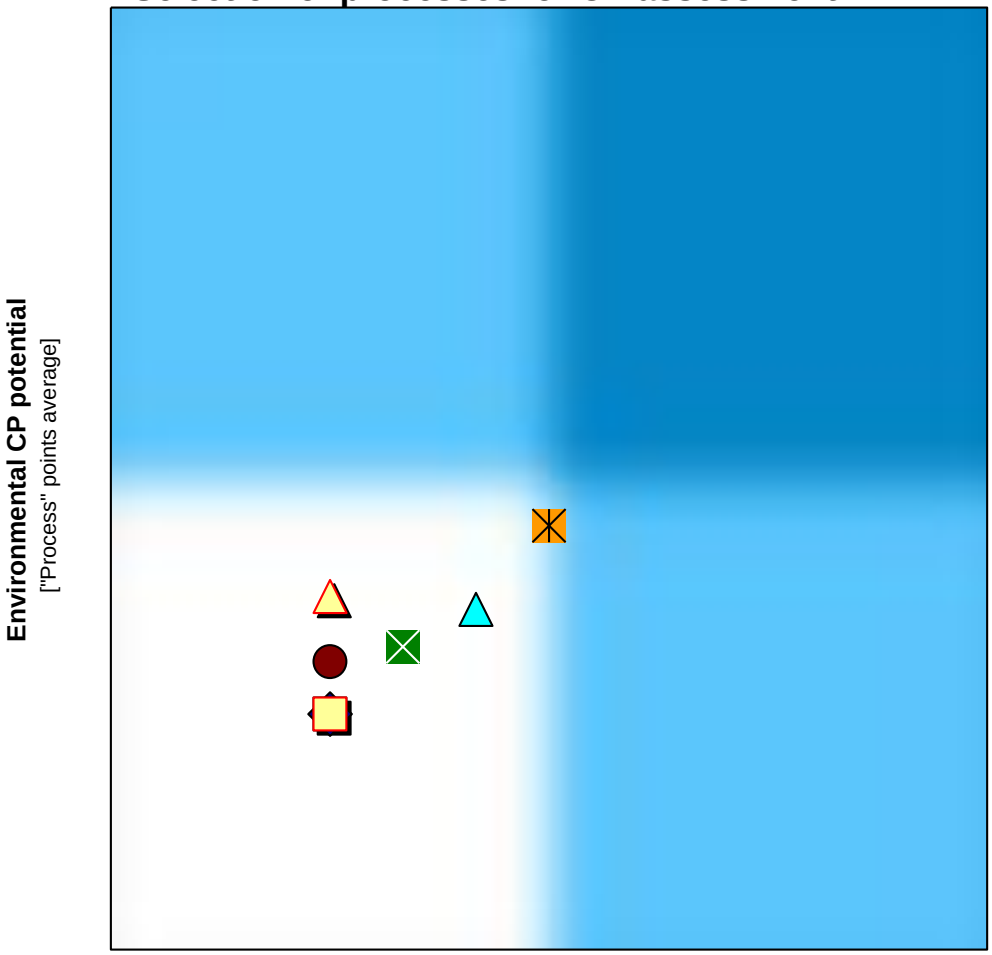
Processes


Hotel Management
Human Resources
Financial - Accounting Resources
Administration Operation
Quality assurance
Reception
Bar club
Offices
Conference halls
Accommodation - Rooms
Kitchen
Restaurant
Pastry cook laboratory
Laundry
Hair dressing
Storage
Heat processing
Transport

Quick Scan

Matrix of CP potentials
Selection of processes for CP assessment

Sustainable Development of Hotels in Bulgaria and Romania
Silva Hotel



- Reception, Bar club, offices
- Conference halls
- Rooms and corridors
- Kitchen and restaurant
- Laundry
- Entire building
- Process heat
- Energy management

Since the safety and health aspects, transport or storage are not assessed on economic CP potentials in this software, the respective aspects are only drawn in diagram II and are not entered in the potential matrix.

KPI vs. Swiss or European Hotel

N	Product	Unit	KPI (1st quarter 2008)	KPI (April 2008)	Benchmark figures
1	*Electricity*	*kWh/ SEPR*	*5.6*	*5.7*	*12-18*
2	*Heating energy (Natural gas)*	*kWh/m²*	*96.1*	*94.2*	*120-180*
3	*Water*	*litres / SEPR*	*223.2*	*223.2*	*140-220*
4	*Solid waste*	*kg / SEPR*	*0.55*	*0.71*	*0.35-0.75*
5	*Cleaning products*	*kg / SEPR*	*0.113*	*0.132*	*0.065-0.075*

KPI vs. Worldwide benchmark information

	Product	Unit	KPI (1st quarter 2008)	KPI (April 2008)	Benchmark figures
1	*Electricity*	*kWh/ SEPR*	*5.6*	*5.7*	*12-18*
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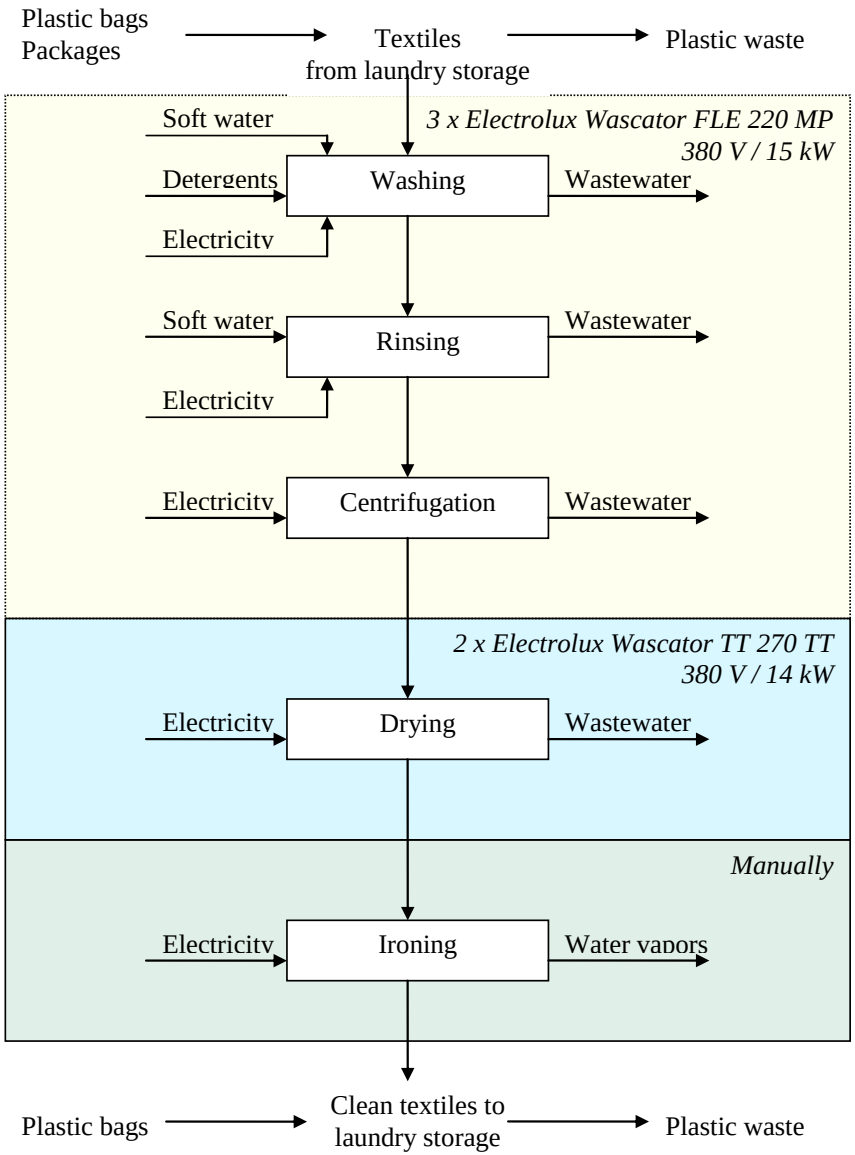
Flow diagrams (example)



Material balances (example)

Unit operation	Input material		Output material		Waste	
	Name	Quantity	Name	Quantity	Name	Quantity
Laundry	Soft water	75 m^3	Textiles	7453.8 kg	Wastewater	75.27 m^3
	Alkaline detergent	184.8 kg			Water vapours	No data available
	Fabric softener	24 kg				
	Bleaching chemical	60 kg				
	Textiles	7453.8 kg				
	Electricity	3547 kWh				
TOTAL		82722.6 kg		7453.8 kg		~75200 kg
		3547 kWh				

Cost assignment to waste streams (example)

Waste stream	Quantification of waste stream	Characterization of waste stream	Cost Assignment
Wastewater from laundry	75.27 m3 / month	pH = 6.5-8.5; NH4 = 30 mg/l, COD-Cr = 500 mgO2/l, BOD5=300 mg O2/l; Synthetic detergents = 25 mg/l; residual Cl = 0.5 mg/l.	Fresh water= 75 m3 x 2 RON/m3 Alkaline detergent = 184.8 kg x 75 lei/10 kg Fabric softener = 24 kg x 8.5 RON/kg Bleaching chemical = 60 kg x 2.5 RON / kg

Cause analyses (example)

Waste stream	Cause	Cleaner Production Options
Entire building		
1. Heat losses	1.1 Natural ventilation	1.1.1 Install a centralised ventilation system
	1.2 Building shell seems not to be very effective for insulation	1.2.1 Consider replacing / repairing building shell
1. Wastewater	2.1 The cleaning of grit-stone surfaces is made manually	2.1.1 Procurement of an automat cleaning equipment for grit-stone covered surfaces
	2.2 No control on chemicals dosage	2.2.1 Procurement of an new automat cleaning equipment for grit-stone covered surfaces

Screening of CP options (example)

Option		CP	DI	W	R	Comment / Reason
Entire building						
1.	Install a centralized ventilation system	Process or production change		X		High investment. Retained for future evaluation
2.	Consider replacing / repairing building shell	Process or production change		X		Evaluated
3.	Procurement of a new automated cleaning equipment for grit stone covered surfaces	Process or production change		X		Evaluated

Analysis of workable options

- *Observations*
- *Description of option*
- *Economic feasibility*
  - **Investments**
  - **Operational costs (estimated):**
  - **Savings (estimated)**
  - **Payback period**
  - **ROI**
- *Environmental feasibility*
  - **Drawbacks**
  - **Benefits**
- *Technical and organizational considerations*

Evaluation of workable options

	Option	Economic feasibility 40%	Environ. feasibility 25%	Technical viability 25%	Organizational viability 10%
20	Change the 500 W halogen lamps	☒☒☒☒	☒☒☒☒	☒☒☒	☒☒☒☒
26	Install flow restrictors in bathrooms (showers)	☒☒☒☒	☒☒☒	☒☒☒	☒☒☒☒
26	Install flow restrictors in bathrooms (sinks)	☒☒☒☒	☒☒☒	☒☒☒	☒☒☒☒

Action plan for selected options

Options selected:

- Change the 500 W halogen lamps – Rooms
- Install flow restrictors in bathrooms – Rooms
- Train the staff on energy savings procedures
- Train the staff on efficient water use
- Train kitchen staff on efficient water use.

Acknowledgements

- United Nations Industrial Development Organization – UNIDO
- Swiss State Secretariat for Economic Affairs – SECO
- Unit for Sustainable Enterprise Development, Romania (USED)