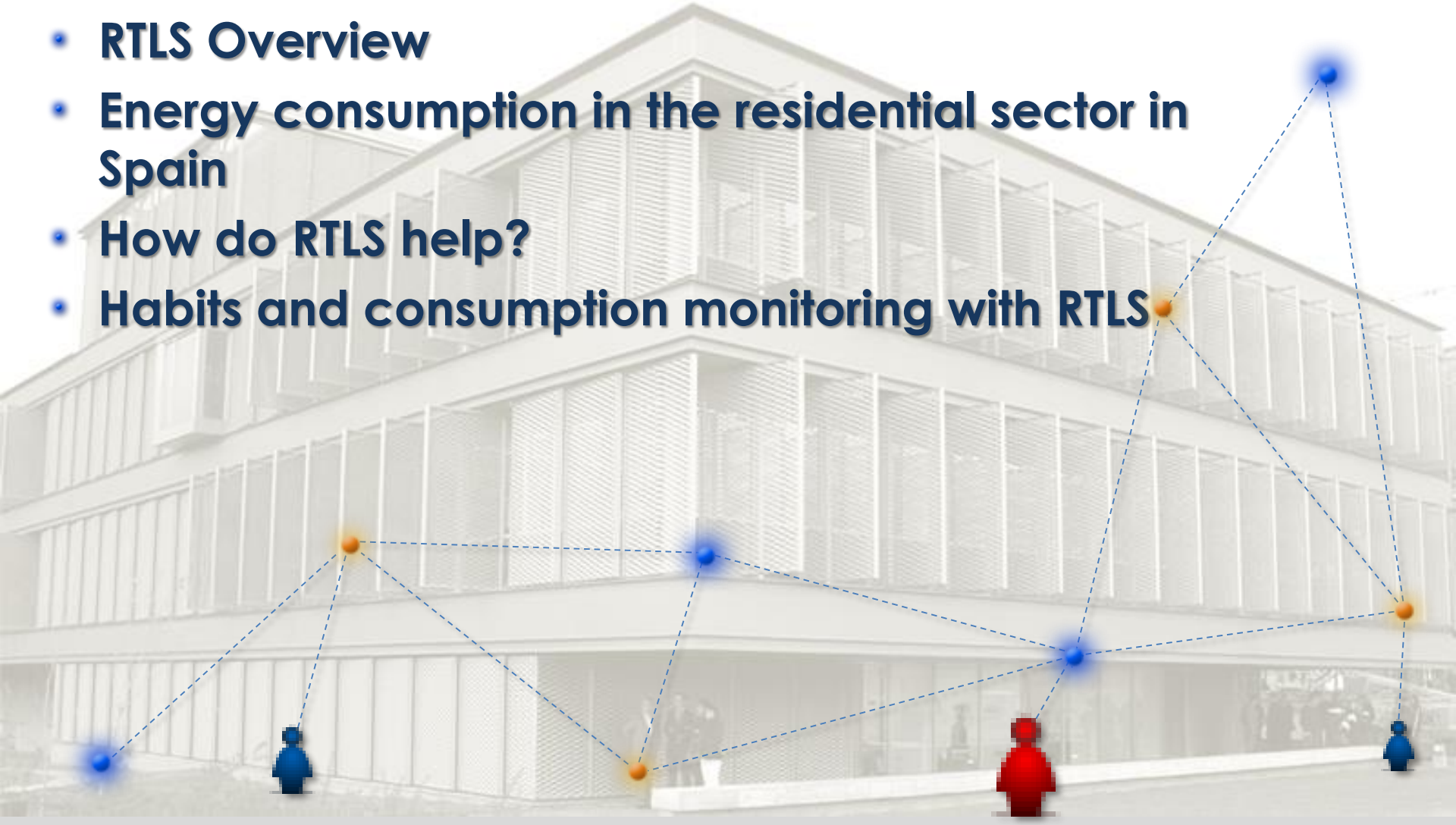# Advantages of using RTLS to enable efficient power consumption

Óscar García
## Dream-Go Workshop
Porto, 6th April 2016

- **RTLS Overview**
- **Energy consumption in the residential sector in Spain**
- **How do RTLS help?**
- **Habits and consumption monitoring with RTLS**

- **RTLS are used for determining the position of a mobile element throughout the environment.**

- **Indoor locating needs more development than outdoor:**

- **Efficient and low-cost infrastructures.**

- **Accuracy is a problem that requires innovative solutions.**

- **The most important aspects in the locating process are the kinds of sensors used and the locating techniques applied.**

- **Real-Time Locating Systems:**
  - 293 million USD in 2012
  - **4.000 million USD in 2022**
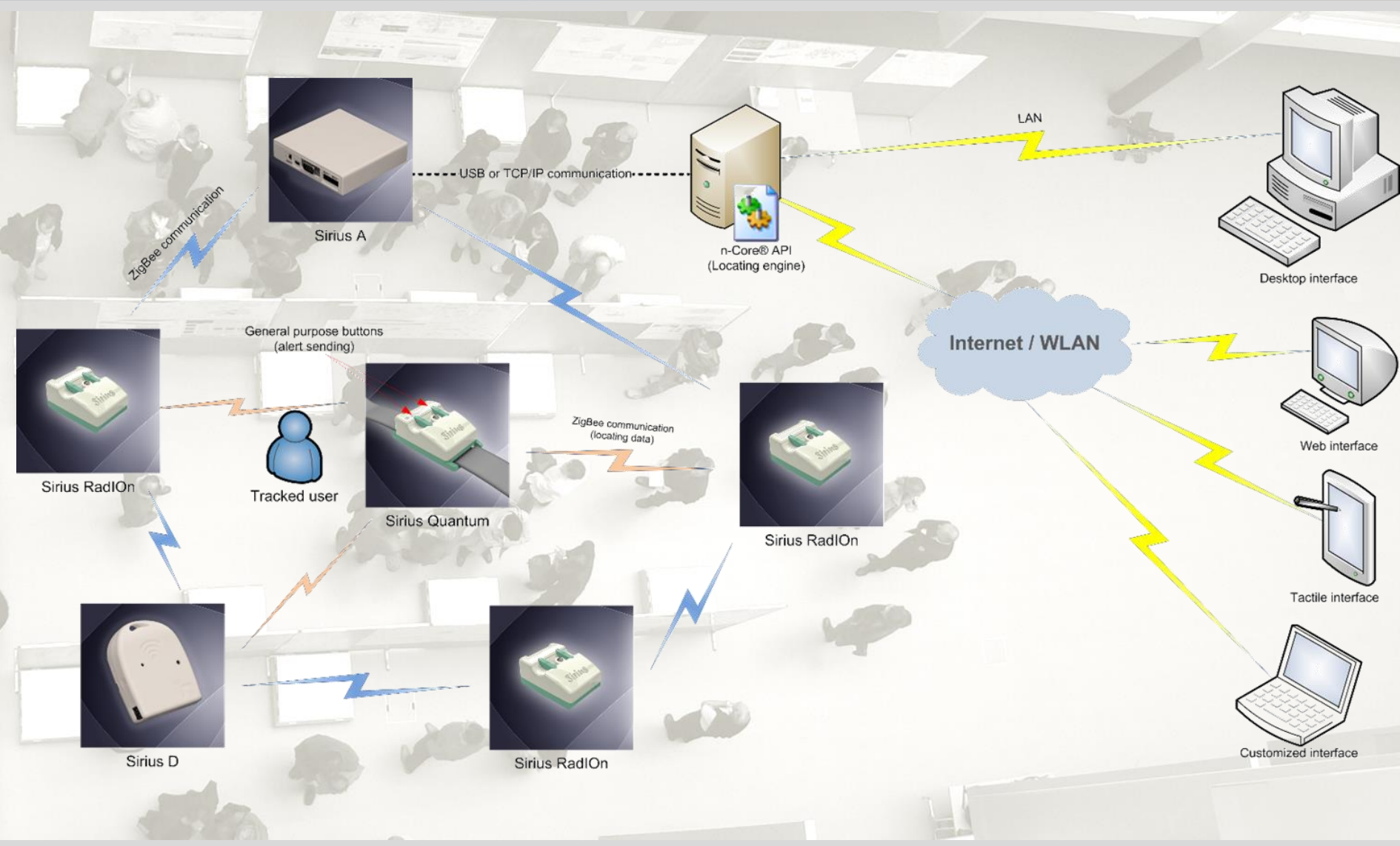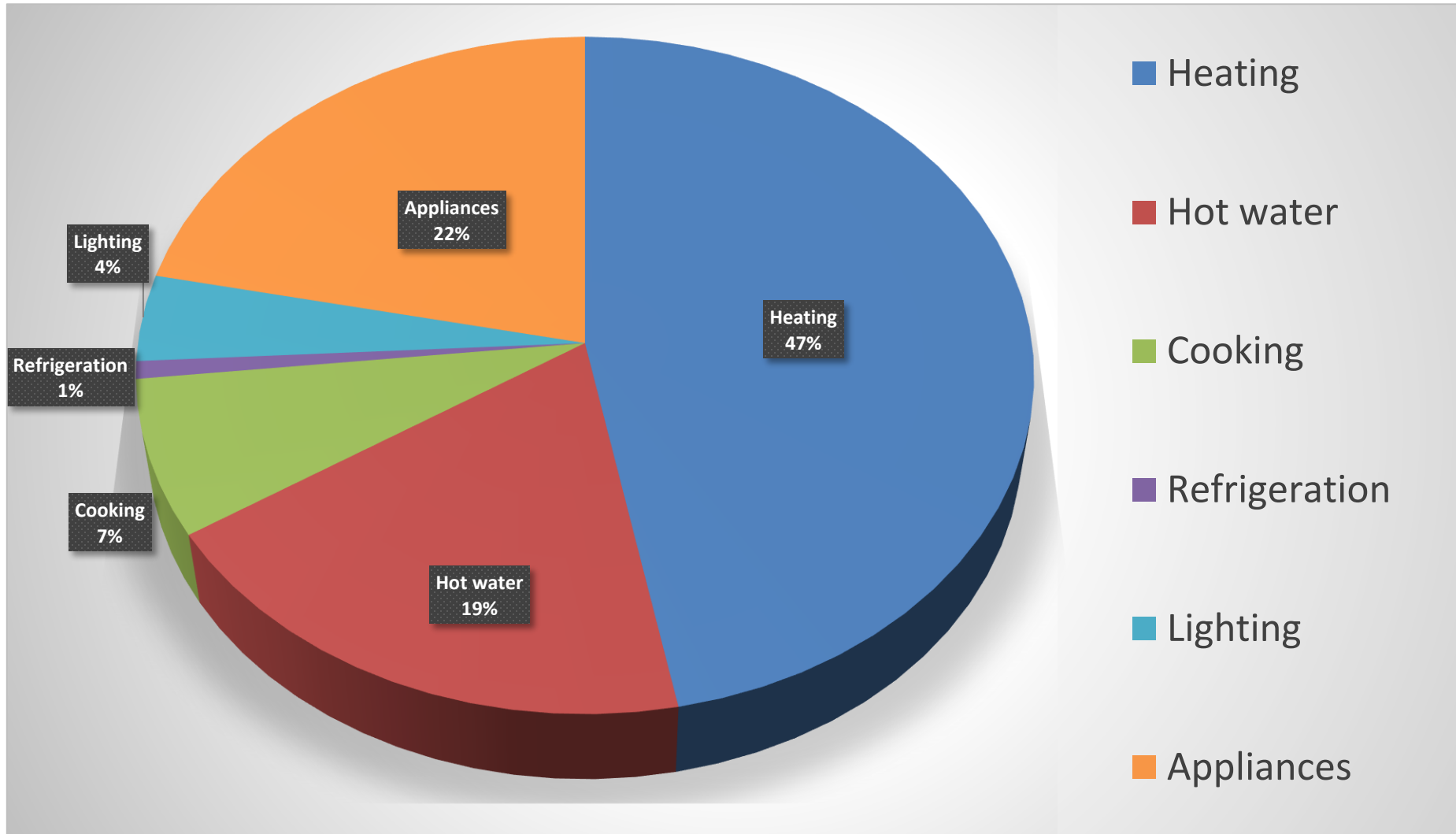
Healthcare

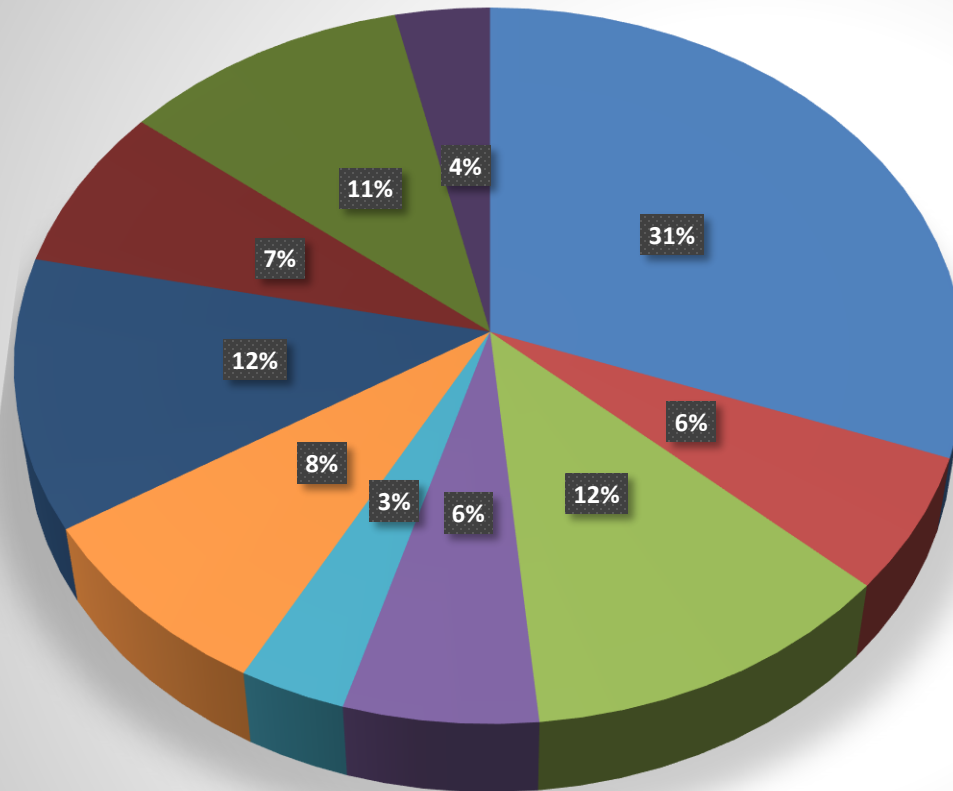Energy and Environment

Security

Industry

Smart Cities

Energy consumption in the residential sector in Spain

Appliances consumption

Legend:
- Fridge — 31%
- Freezer — 6%
- Washing machine — 12%
- Dishwasher — 6%
- Dryer — 3%
- Oven — 8%
- TV — 12%
- PC — 7%
- Stand-by — 11%
- Other equipment — 4%

- **RTLS are used for determining the position of a mobile element throughout the environment.**
- **Habits of users:**
  - **When are consumers at home?**
  - **Where consumers are?**
  - **What are they doing?**
- **Consumptions:**
  - **Meters**
  - **Sensors**
- **Combine both information**
  - **Improve using**
  - **Avoid unnecessary consumptions**

Electric Energy Price in Spain

	Mon	Tue	Wed	Thu	Fri	Sat	Sun
00:00	0,1193	0,1215	0,1198	0,1211	0,1216	0,1188	0,1149
01:00	0,1144	0,1170	0,1158	0,1183	0,1167	0,1146	0,1096
02:00	0,1139	0,1140	0,1135	0,1155	0,1148	0,1117	0,1076
03:00	0,1134	0,1133	0,1129	0,1155	0,1150	0,1115	0,1064
04:00	0,1125	0,1137	0,1126	0,1148	0,1144	0,1114	0,1065
05:00	0,1137	0,1151	0,1137	0,1144	0,1154	0,1120	0,1062
06:00	0,1204	0,1200	0,1195	0,1199	0,1211	0,1128	0,1075
07:00	0,1243	0,1252	0,1251	0,1225	0,1264	0,1126	0,1052
08:00	0,1275	0,1281	0,1285	0,1265	0,1285	0,1197	0,1089
09:00	0,1308	0,1305	0,1308	0,1291	0,1306	0,1231	0,1107
10:00	0,1304	0,1302	0,1303	0,1287	0,1300	0,1247	0,1116
11:00	0,1311	0,1303	0,1303	0,1287	0,1300	0,1262	0,1134
12:00	0,1300	0,1286	0,1283	0,1271	0,1285	0,1240	0,1118
13:00	0,1289	0,1286	0,1274	0,1261	0,1274	0,1245	0,1133
14:00	0,1269	0,1256	0,1245	0,1239	0,1255	0,1217	0,1125
15:00	0,1233	0,1229	0,1217	0,1210	0,1222	0,1146	0,1053
16:00	0,1230	0,1227	0,1215	0,1215	0,1220	0,1116	**0,1036**
17:00	0,1238	0,1239	0,1229	0,1228	0,1231	0,1115	0,1042
18:00	0,1259	0,1252	0,1248	0,1255	0,1245	0,1158	0,1113
19:00	0,1296	0,1280	0,1271	0,1280	0,1262	0,1196	0,1173
20:00	0,1322	0,1311	0,1300	0,1307	0,1290	0,1239	0,1234
21:00	**0,1356**	0,1347	0,1337	0,1340	0,1329	0,1292	0,1325
22:00	0,1311	0,1303	0,1296	0,1297	0,1295	0,1261	0,1304
23:00	0,1238	0,1230	0,1232	0,1238	0,1233	0,1183	0,1221

		COST OF USE AND SAVING				
	Consume (W/h)	Mx. Price	Av Price	Min. Price	Difference	Yearly
Price		0,1356 €	0,1196 €	0,1036 €		
Cooking	2.200	0,2983 €	0,2631 €	0,2279 €	0,0704 €	25,6960 €
Fridge	110	0,0149 €	0,0132 €	0,0114 €	0,0035 €	0,0000 €
Freezer	842	0,1142 €	0,1007 €	0,0872 €	0,0269 €	0,0000 €
Washing machine	1.050	0,1424 €	0,1256 €	0,1088 €	0,0336 €	6,9888 €
Dishwasher	1.148	0,1557 €	0,1373 €	0,1189 €	0,0367 €	5,7308 €
Dryer	270	0,0366 €	0,0323 €	0,0280 €	0,0086 €	1,7971 €
Oven	1.200	0,1627 €	0,1435 €	0,1243 €	0,0384 €	9,9840 €
TV	156	0,0212 €	0,0187 €	0,0162 €	0,0050 €	3,6442 €
PC	64	0,0087 €	0,0077 €	0,0066 €	0,0020 €	2,9901 €
Iron	1.200	0,1627 €	0,1435 €	0,1243 €	0,0384 €	3,9936 €
Hair dryer	1.875	0,2543 €	0,2243 €	0,1943 €	0,0600 €	6,2400 €
						67,0646 €

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- **RTLS and WSN can help to monitor consumptions.**
- **New models of analysis:**
  - **Improve use of energy**
  - **Avoid unnecessary consumptions**
- **Savings:**
  - **Energy**
  - **Tariff rates**

Key issues!

Aware users of the efficient use of energy at optimal times and promote environmentally friendly habits

Thank you for your attention!

nebusens@nebusens.com
@nebusens
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