

**CALCULATION OF ENERGY SAVING FOR INSTALLATION OF NR 4 SHOWERS EASY SHOWER® IN SPORTIVE LOCKER ROOM / GYM WITH CENTRALIZED WATER PRE-MIXED, IN REPLACING OF NR 4 SHOWERS WITH NORMAL TAPS AND SHOWER HEADS**

WATER CONSUMPTION NR 1 SHOWER	20	l/min
AVERAGE TEMP. WATER	40	°C
AVERAGE TIME OF ONE SHOWER	6	min
ACTUAL AVERAGE TIME OFF IN THE SHOWER	4,5	min
ACTUAL AVERAGE TIME OUT OF THE SHOWER	1,5	min
OPENING TIMES GYM 9,00-22.00	13	h
ANNUAL OPENING TIMES GYM (2015)	282	day
AVERAGE N° SHOWERS MADE IN 1 HOUR	8	
AVERAGE N° SHOWERS MADE IN 1 DAY	104	
AVERAGE N° SHOWERS MADE IN 1 YEAR	29328	
ACTUAL TIME HOT WATER CONSUMPTION	468	min/day
	7,8	h/day
ACTUAL TIME WASTAGE HOT WATER	156	min/day
	2,6	h/day
DAILY WASTAGE	3120	l/day
	3,12	mc/day
ANNUAL WASTAGE	880	mc/year

**CALCULATION FOR ENERGY NEEDS SANITARY HOT WATER**

$$Q_w = P_w * C_w * [V_w * (\theta_{er} - \theta_o)] * G$$

P <sub>w</sub> = WATER DENSITY (fixed value)	1000	kg/mc
C <sub>w</sub> = SPECIFIC HEAT WATER (1,162 * 10 <sup>-3</sup> ) [kWh / (kg * K)] (fixed value)	0,001162	kWh/kg
V <sub>w</sub> = WATER VOLUME DAILY WASTED (1000l/day=1mc/day)	3,12	mc/day
θ <sub>er</sub> = WATER TEMPERATURE SUPPLIED	40	°C
θ <sub>o</sub> = COLD WATER TEMPERATURE INPUT	10	°C
G= PERIOD UNDER CONSIDERATION FOR THE CALCULATION	282	day
Q <sub>w</sub> = ENERGY NEEDS SANITARY HOT WATER	30671	kWh/year
	26372503	kcal/year

CALCULATION OF IMP. ACS LOSSES NOT EXAMINED FOR MISSING DATA (EVALUATE TOT kWh BE ADDED)

CONSUMPTION / WASTAGE GAS-METHANE	3197	mc/year
AVERAGE BOILER PERFORMANCE 80% (20% GAS / METHANE CONSUMPTION / WASTAGE IN MORE)	3836	mc/year

**CALCULATION OF WATER AND GAS COST CONSUMPTION / WASTAGE**

WATER COST AREA FORLI'-CESENA ("HERA SPA" RANGE + DI 192mc / year = 0,526mc / day)	2,7	€/mc
GAS / METHANE COST 2022 (Autorità di Regolazione per Energia Reti e Ambienti - ARERA)	0,89	€/mc
ELECTRIC ENERGY COST 2022 (Autorità di Regolazione per Energia Reti e Ambienti - ARERA)	0,31	€/Kwh
WASTED WATER COST	2376	€/year
WASTED GAS / METHANE COST	3414	€/year
ELECTRIC ENERGY COST / kWh Wasted (1000 liters x H2O HOT ΔT / 860) x € / kWh	9508	€/year
<b>TOTAL SAVINGS OF NR 4 EASY SHOWER® SHOWERS, INSTALLED IN PLACE OF NR 4 SHOWERS WITH TAPS / MIXERS AND NORMAL</b>	<b>15298</b>	<b>€/year</b>

**ANNUAL SAVINGS OF CO2 EMISSION (CO2= 1949 grams/mc of gas) 6230304,13 g = 6,23 t**

Note: All data in the table can be taken as a real example of calculation and can be changed in the Excel sheet, personalizing them to enjoy having an automatic result

To insert custom data can request to Roberto Rossi Design. They will be sent the results.