DDI ROI on GREY and BLACK Water Recovery- pre heating the Hot water tank

	A	B	C	D	E	F
1	DDI ROI on GREY and BLACK Water Recovery- pre heating the Hot water tank					
2						
3		INPUT		CALCULATED		NOTES
4	SAVED IN WASTED ENERGY					
5	Number of ROOMS in HOTEL or CONDO APPARTMENTS or HOSPITAL rooms	500				
6	FLOW per UNIT gpm	0.164				0.164
7	ASSUMED FLOW PER (GPM) HOT WASTED SIDE			82		More if there is a Restaurant? A lLundry Facility etc, (in sample 2.6 L/S x 2)
8		0.5				Assume in an Average that the Pre heated to the Boiler water = 1/2 of the GREY BLACK flow
9	WATER FLOW to CENTRAL BOILER (we pre heat)			41		It can be measured with simple WATER flow Meter, Part of the BTU METER (assume 2.6 L/S)
10						
11	Average yearly TEMP of the COLD WATER FLOWING to the CENTRAL BOILER	45				Can be measured with Simple Water IN and OUT Temp Readers- part of the BTU METER (assume here 7.2 deg C)
12						
13	Average yearly TEMP of Wasted GREY + BLACK flow			86		Asssume 86 Deg F (30 deg C) - note Shower is much hotter by far
14						
15	DT (Temp rise deg F for the Pre Heated Cold Water going to the Boiler-WITH NO HEAT PUMP	10				Without Heat Pump ?
16	Multiplier	3.0				COP Coefficient Of Performance (x 3 with good heat pump) 10 DEG F x 3 with heat pump
17	DT (Temp rise deg F for the Pre Heated Cold Water going to the Boiler-WITH HEAT PUMP			30		
18						
19	BTUH PRE HEATED			615,492		flow in usgpm * (temp increase in deg f) * 8.34 * 60 = btuh
20	KW PER YEAR SAVED			180		
21						
22						
23	HOURS per day used	12				Average hours per day flow ?
24	Days per year used	365				
25						
26	BTU YEARLY SAVED			2,695,854,960		
27	KW YEARLY SAVED			789,416		
28						
29	COST PER KW (Dollar)	0.10				Electricity ?? Or Natutral Gaz ? Tax included
30	DOLLARS SAVED PER YEAR			$ 78,942		
31						Note-using the City Pressure for the Cold Water, and the Height pressure for the Wasted Sewage
32						
33						
34	COST TO INSTALL					
35						
36	DDI HEAT EXCHANGER	$ 50,000				Capital cost
37						
38	INSTALLATION- PIPING- LICENCING-ENGINEERING	$ 10,000				
39						
40	BTU METER wih TRANSMISSION OF DATA and RECORDING OF DATA	$ 10,000				BTU METER (2 -4 Temp, 2-4 Pressure, 1 Water flow meter)
41						
42	HEAT PUMP	$ 10,000				
43						
44	Shipping and Misc	$ 5,000				
45						
46	OVER HEAD etc	$ 15,000				
47	''					
48	TOTAL COST			$ 100,000		
49						
50						
51	ROI Return On Investment in Years			1.3		Plus the benefit of MARKETING to the HOTEL or HOSPITAL, plus Goverenemnt Grants etc
52						
53						