

## What is Watt?

### Van Watt naar GJoules:

$$1 \text{ Watt} = 1 \text{ J/s} \Rightarrow$$

$$1 \text{ Joule} = 1 \text{ Ws}$$

$$1000 \text{ J} = 1 \text{ KJ} = 1 \text{ KWs}$$

$$1.000.000 \text{ KJ} = 1.000 \text{ MJ} = 1 \text{ GJ}$$

$$1 \text{ GJ} = 1000 \text{ MWs} = 1000 \text{ KWh} / 3600 = 278 \text{ KWh}$$

### Van gas naar Co2:

$$1 \text{ m}^3 \text{ gas} = 8,8 \text{ KWh} = 31,6 \text{ MJ}$$

$$1 \text{ m}^3 \text{ gas stoot } 1,98 \text{ kg CO}_2 \text{ uit}$$

### Water opwarmen:

$$1 \text{ liter water met } 1 \text{ graad Celsius opwarmen kost } 1 \text{ Kcal} = 4,18 \text{ KJ}$$

$$Q = m \cdot C \cdot \Delta T / A =$$

opbrengst per m<sup>2</sup> = massastroom x soortelijke warmte x delta T / oppervlak

$$kW/m^2 = kJ/sec = kg/sec \cdot kJ/kg \cdot K \cdot K / m^2$$

### Pijpdiameters en volume:

$$\text{Omtrek cirkel} = \pi D \quad \text{Oppervlak} = \pi r^2$$

### Binnen diameter pijp en het volume per meter:

$$18 \text{ mm} = 0,25 \text{ liter}$$

$$22 \text{ mm} = 0,38$$

$$28 \text{ mm} = 0,62$$

$$40 \text{ mm} = 1,26$$

$$50 \text{ mm} = 1,96$$

$$60 \text{ mm} = 2,83$$

$$80 \text{ mm} = 5,02$$

$$100 \text{ mm} = 7,85$$

$$125 \text{ mm} = 12,3$$

### Bijvoorbeeld:

Triple Solar paneel = 4 meter x 12 buizen van 18mm + 2 x header 22mm =>

$$= (12 \times 0,25 \times 4) + (2 \times 1,2 \times 0,38) = 12,91 \text{ liter} / 4,8\text{m}^2 = 2,7 \text{ liter/m}^2$$