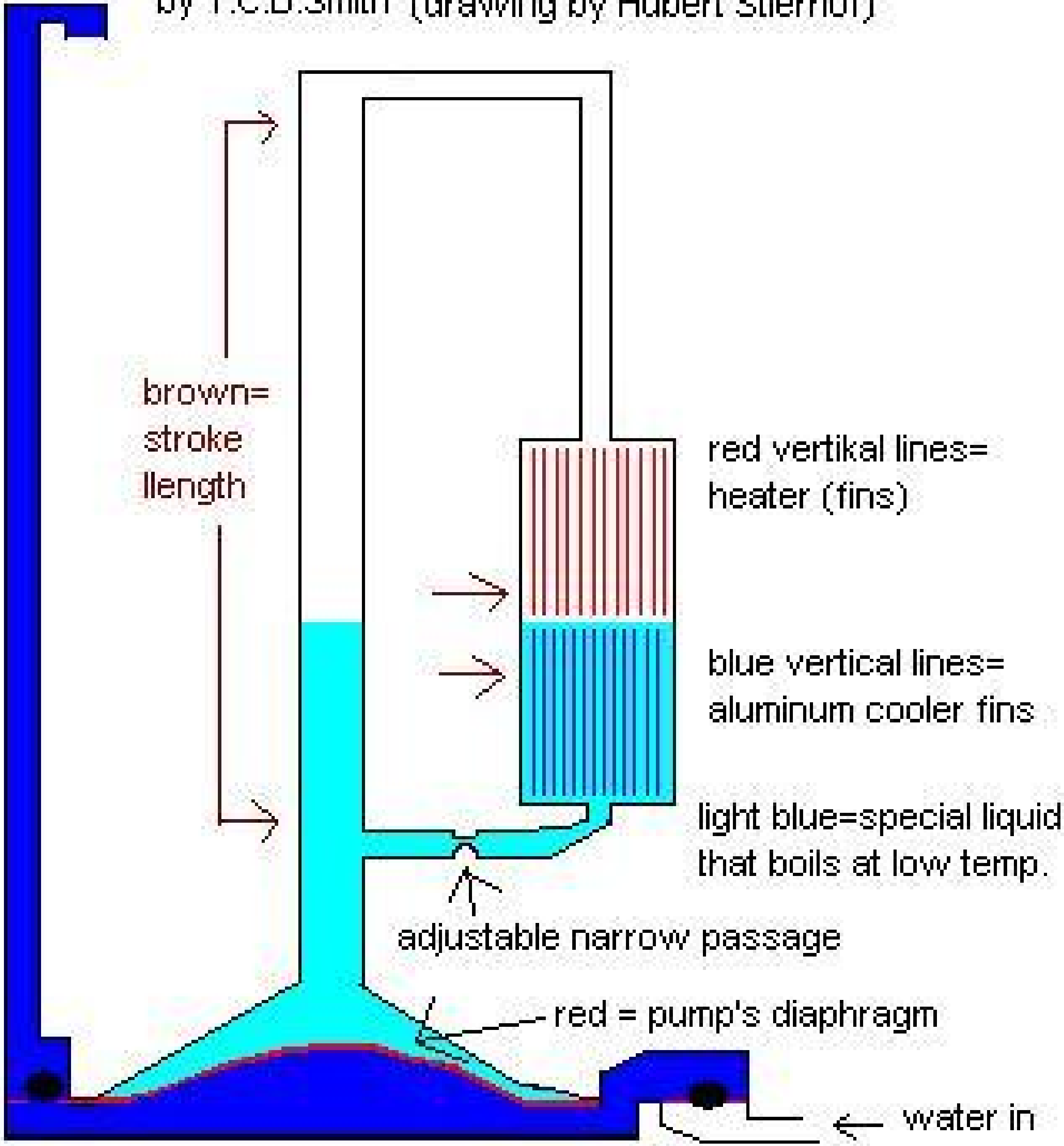
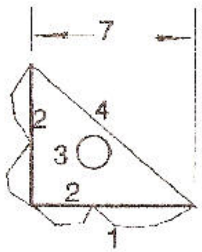
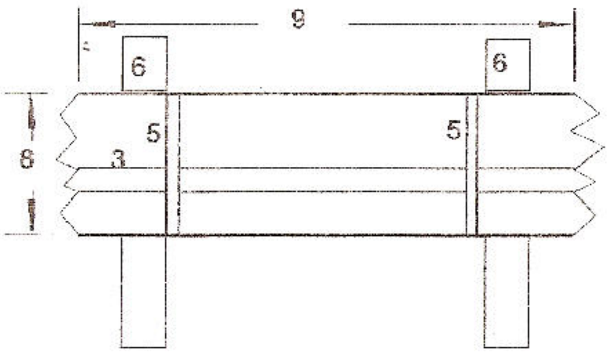
NIFTE (Non-Inertia-Feedback-Thermofluidic-Engine
by T.C.B.Smith (drawing by Hubert Stierhof)



D I Y SOLAR WATER HEATER

Test Data Available on request.





GENERAL CONSTRUCTION

1. Half sawn poles to give flat inside surface. Or planks, planed one side.
2. Flat surfaces @ 90 degrees covered with aluminium foil. **
3. 1" nb. black iron pipe. Or copper pipe.
4. Glass/perspex cover
5. Pipe and reflective surface supports.
6. Main supports (eg, fence posts)
7. Width, approx 16 cm
8. Height approx. 16 cm
9. Length, can be several hundred meters, depending on site.

SKETCH A

Pipe Dia = D"

Distance X = D/sin z

Distance Y = D/cos z

where z = the angle of inclination of the Sun at noon on midsummer day at the location of the solar heating system.

NOTES

** These surfaces must be exactly at right angles. With the back surface vertical. And the front surface level as far as possible.

Any domestic aluminium foil is suitable. Using any cheap adhesive to glue it to the planks. Adhesive backed foil is available but is more expensive.

The position of the pipe in relation to the reflective surfaces is governed by the latitude of the installation, and the sunlight reflective paths. See sketch A.

The whole unit must face directly South, and be in full sunlight at all times. i.e no shading from trees etc.

The system can be used in two ways:-

1. Continuous flow. Water is pumped through the pipes, and is heated to about 80-90°F for central heating.

2. Discontinuous flow. A thermostat at the exit end of the system is set to the maximum temperature expected (about 140°F) with a cut off at (say) 110°F. Once the top temperature is reached the thermostat switches on a pump to deliver the hot water to a storage tank for baths, washing etc. At the lower temperature the pump is switched off to allow further heating of the water in the system piping.

<u>SOLAR WATER HEATER</u> (FROM "HEATING" MAGAZINE AUG 1959 P. 231)

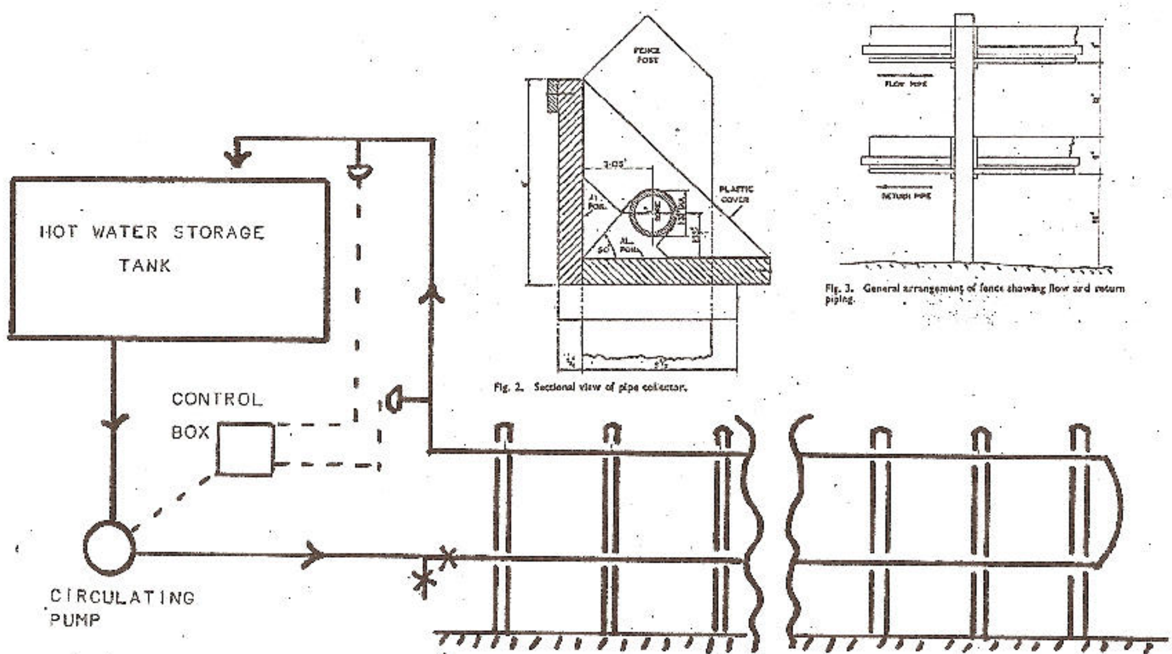


Fig. 2. Sectional view of pipe collector.

Fig. 3. General arrangement of fence showing flow and return piping.

POST & RAILS FENCE WITH COLLECTOR AS THE "RAILS"
SHOULD FACE DUE SOUTH

COST (DO IT YOURSELF)
COLLECTOR ONLY ABOUT £1500(NEW MATL'S)

KWHR/YEAR UP TO 21000, WATER TEMP UP TO 75c
KWHRS/ANNUM/£ = 7 TO 14

£INCOME/£ CAPITAL = 0.2 TO 0.4

A Ferrand Stobart & Associates
Economics & Engineering
Principal: A Stobart BSc (Chem Eng)

Telephone & Fax
UK: 01 568 780837
Intl: (+44) 1568 780837

Bower Orchard, Church Lane
ORLETON Nr. Ludlow
SY8 4HU

Client Ref: A/31005/SOL

Mrs Barbara Carter's Solar Heat Concentrator

References

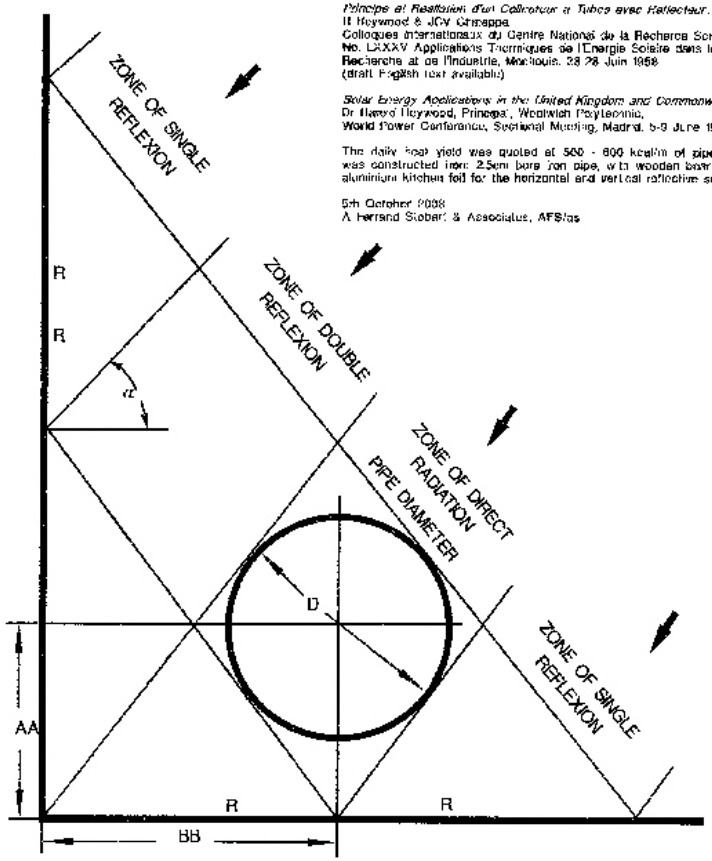
A Solar Heated Swimming Pool, **Heating**, August 1958, vol 21 p 231

Principe et Réalisation d'un Collecteur à Tubes avec Réflecteur.
H Heywood & JCV Chinnappa
Colloques Internationaux du Centre National de la Recherche Scientifique
No. LXXXV Applications Thermiques de l'Energie Solaire dans le Domaine de la **Recherche** et de l'Industrie, Montlouis, 23-28 Juin 1958
(draft English text available)

Solar Energy Applications in the United Kingdom and Commonwealth,
Dr Harold Heywood, Principal, Woolwich Polytechnic,
World Power Conference, Sectional Meeting, Madrid, 5-9 June 1960, page 14

The daily heat yield was quoted at 500 - 600 kcal/m of pipe. The test unit was constructed from 2.5cm bore iron pipe, with wooden boards covered with aluminium kitchen foil for the horizontal and vertical reflective surfaces

5th October 2008
A Ferrand Stobart & Associates, AFS/as



$AA = \dfrac{D}{2\cos\alpha}$ $BB = \dfrac{D}{\sin\alpha}$ RR = Reflective Surface

Where α = the suns inclination at midday on midsummer day

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The diagram below shows the extreme positions for the Caterheat Solar Water Heater pipe for Latitudes from 56 N. [Edinburgh] to 40 N [Madrid}.

The dimensions are for a 25 mm OD pipe are:
AA lower pipe position 23.6 mm, upper pipe position 44.6mm
BB lower pipe position 29.5mm, upper pipe position 25.7mm

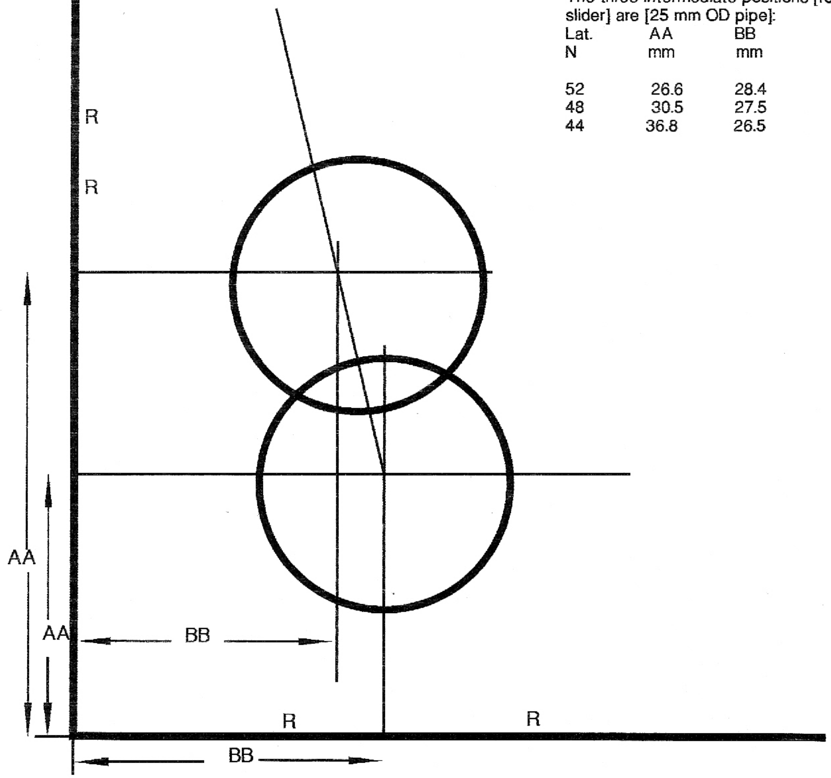
For a 10mm OD pipe the dimensions above should be divided by 2.5

For more Southern Latitudes the whole unit should be tilted back by 20 degrees from the vertical, when Gibralter at Latitude 36N uses the 56N position, and Muscat at 24N uses the 44N position. [Tropic of Cancer]

The Solar angles used are:- 56N = 58, 52N [London] = 62, 48N [Munich] = 66, 44N [Toulouse] = 70, 40N = 74, 36N = 77, 32N [Jerusalem] = 81, 28N [Kuwait] =85, 24N = 90

The three intermediate positions [for marking on the slider] are [25 mm OD pipe]:

Lat. N	AA mm	BB mm
52	26.6	28.4
48	30.5	27.5
44	36.8	26.5

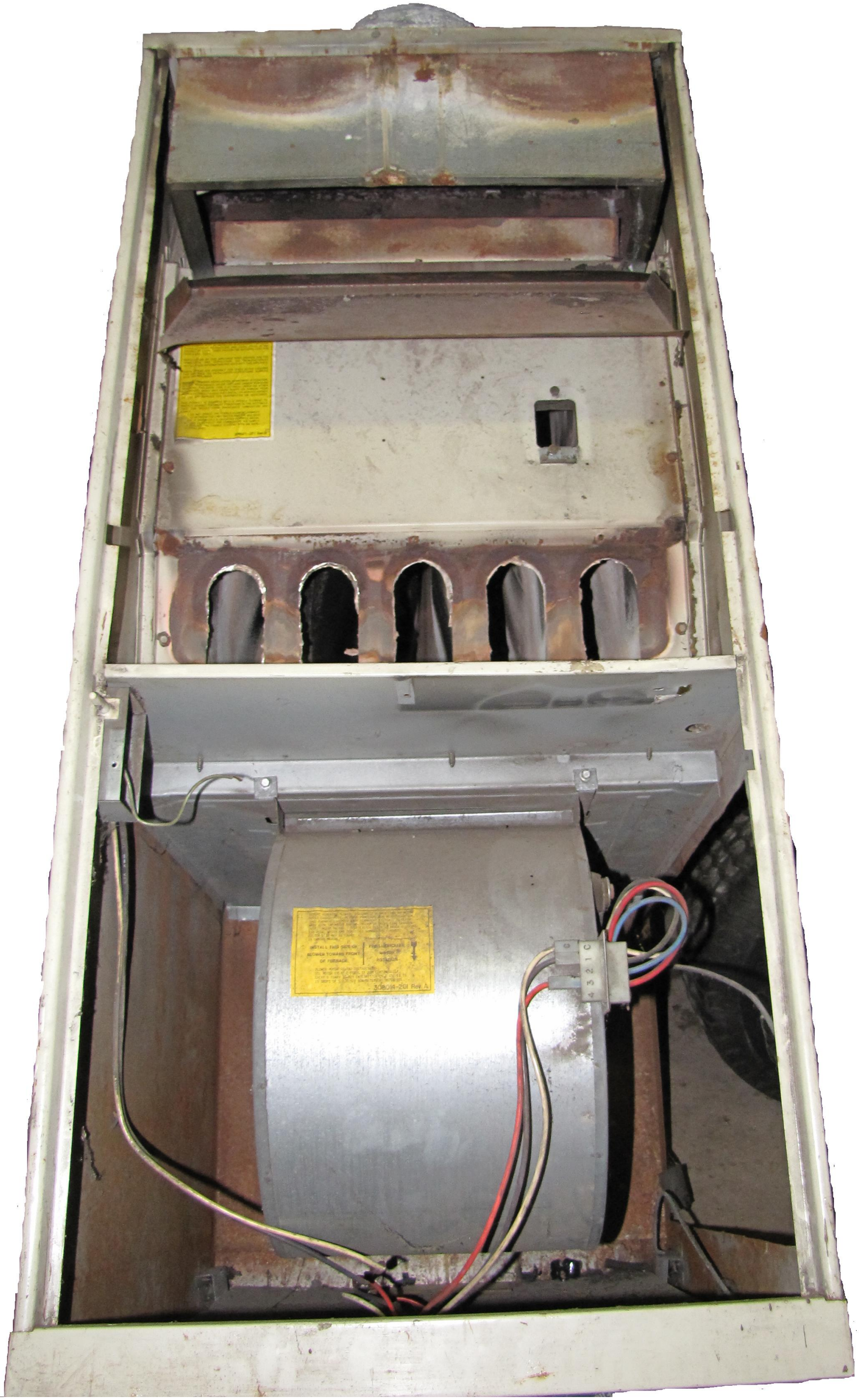


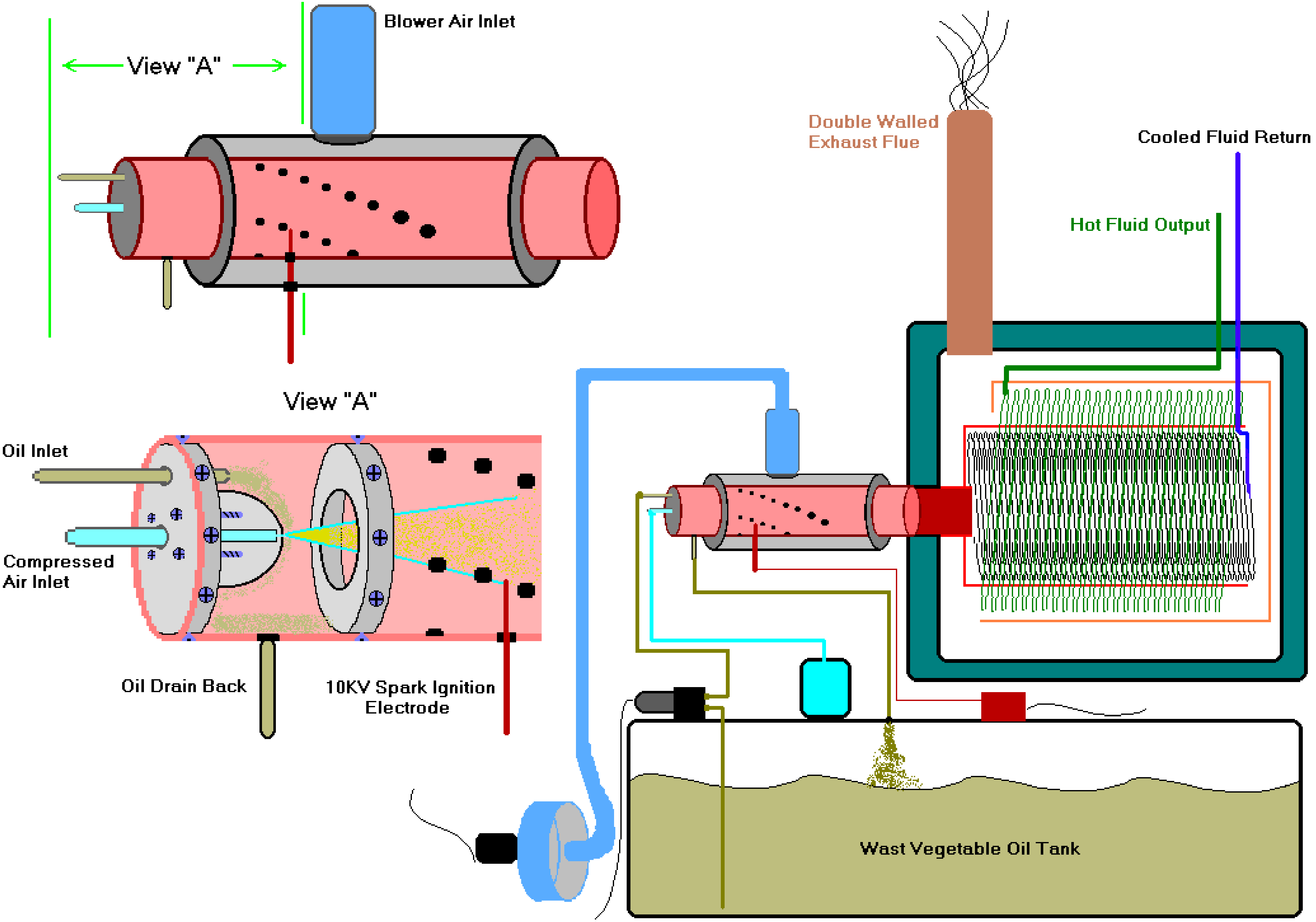
$$AA = \frac{D}{2 \cos\alpha} \qquad BB = \frac{D}{\sin \alpha}$$

Where α = the suns inclination at midday on midsummer day

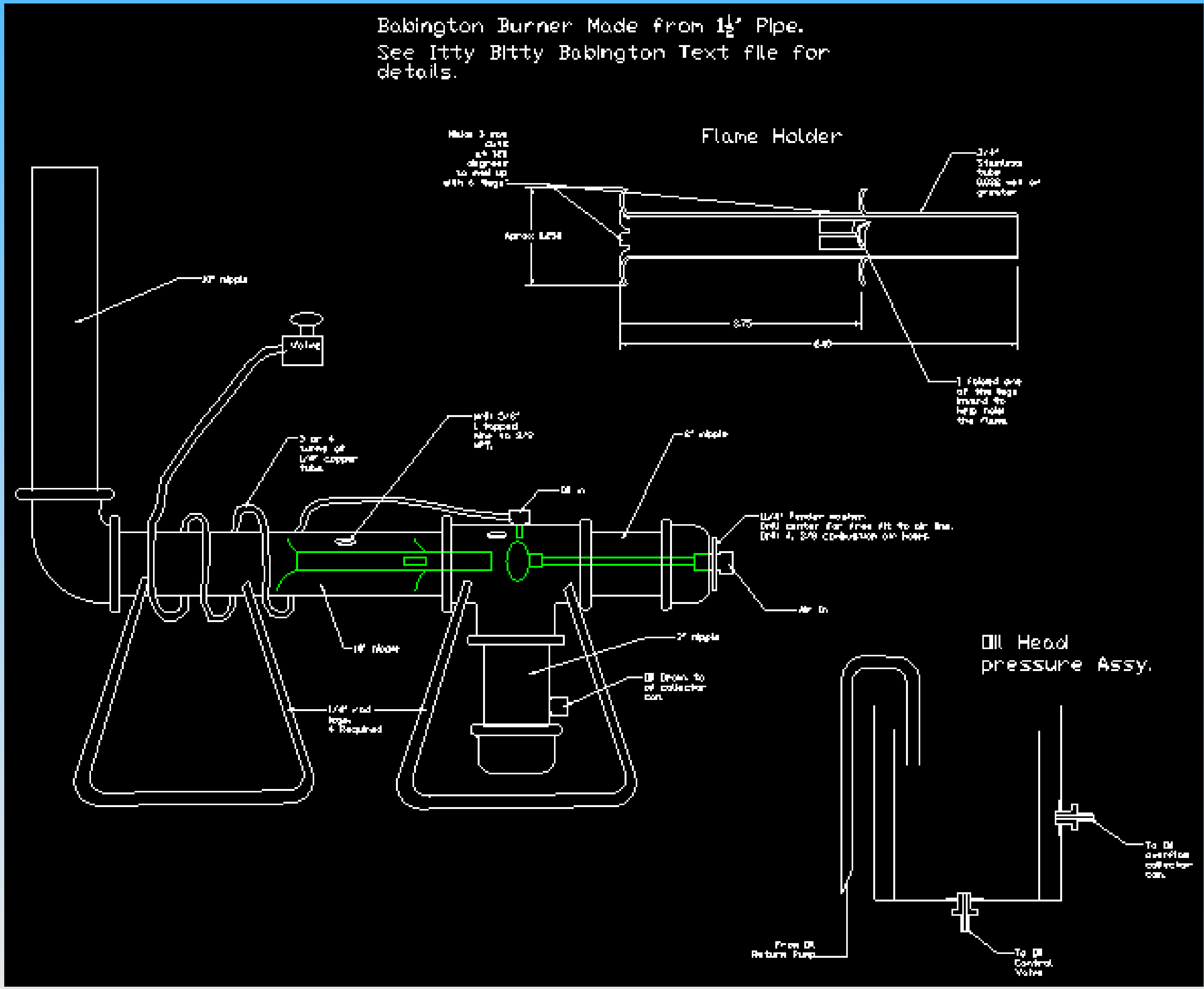
RR = Reflective Surface
This should be 6 pipe diameters Horizontal & Vertical

NOTE. Using a smaller diameter pipe increases the heated area per volume of water in the pipe, going from 25 mm dia. To 10mm dia for instance increases the area to volume ratio from 0.16 to 0.4 a 2.5 times increase. Thus giving probably better heat transfer. Microbore, suitable pressurised might even generate steam, like a flash boiler

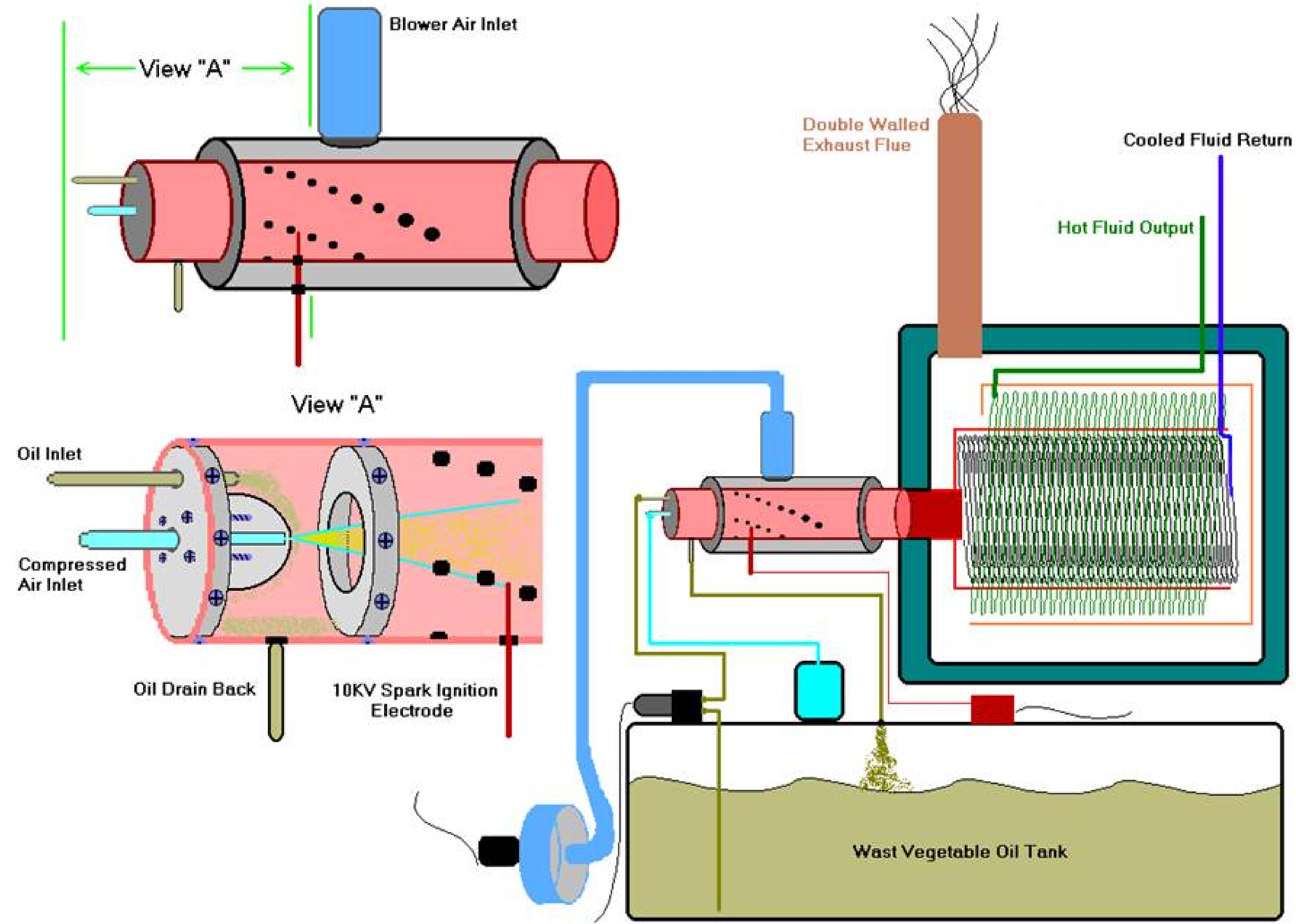

308014-201 Rev. A

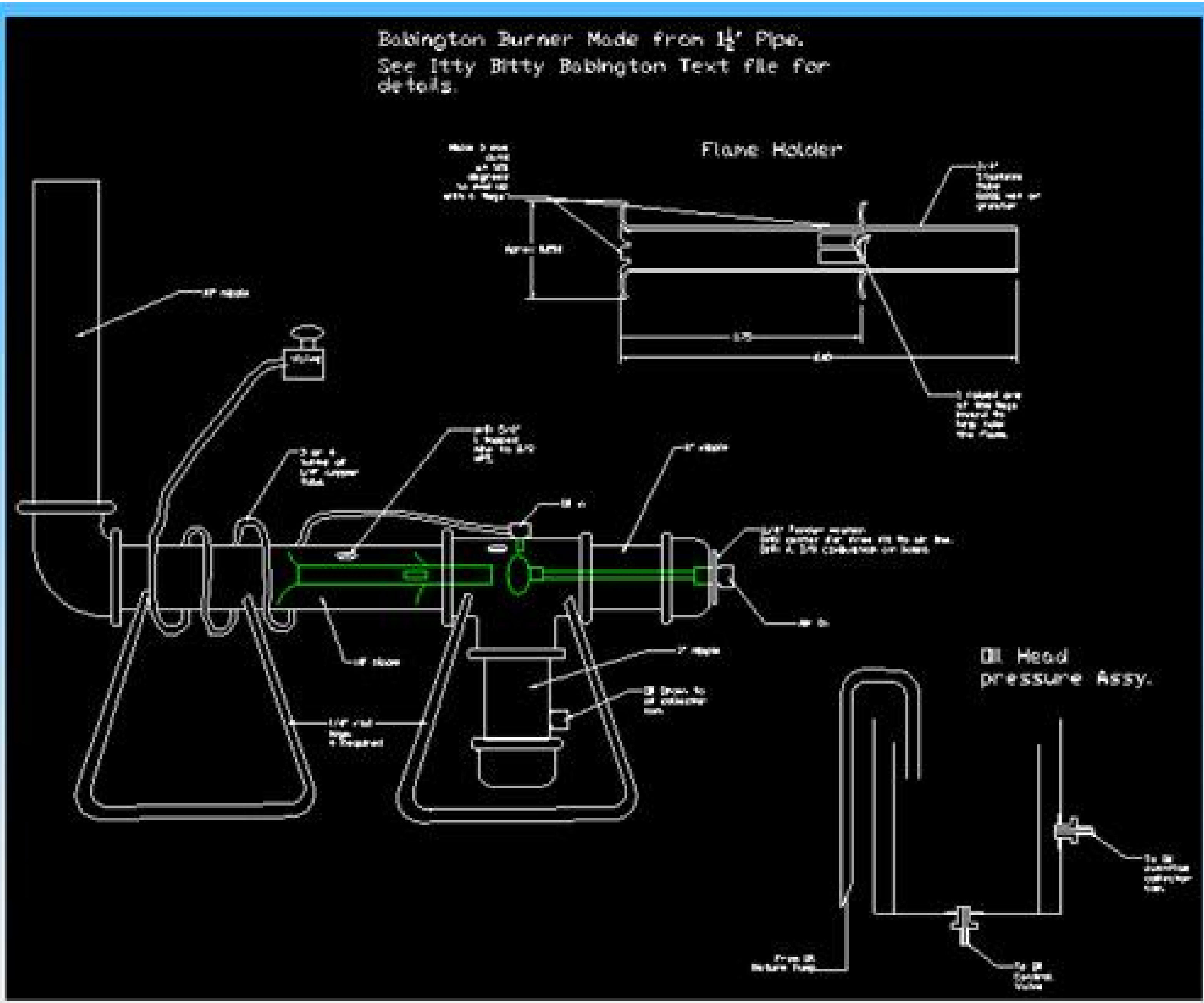


Blower Air Inlet
View "A"
View "A"
Oil Inlet
Compressed
Air Inlet
Oil Drain Back
10KV Spark Ignition
Electrode
Double Walled
Exhaust Flue
Cooled Fluid Return
Hot Fluid Output
Wast Vegetable Oil Tank

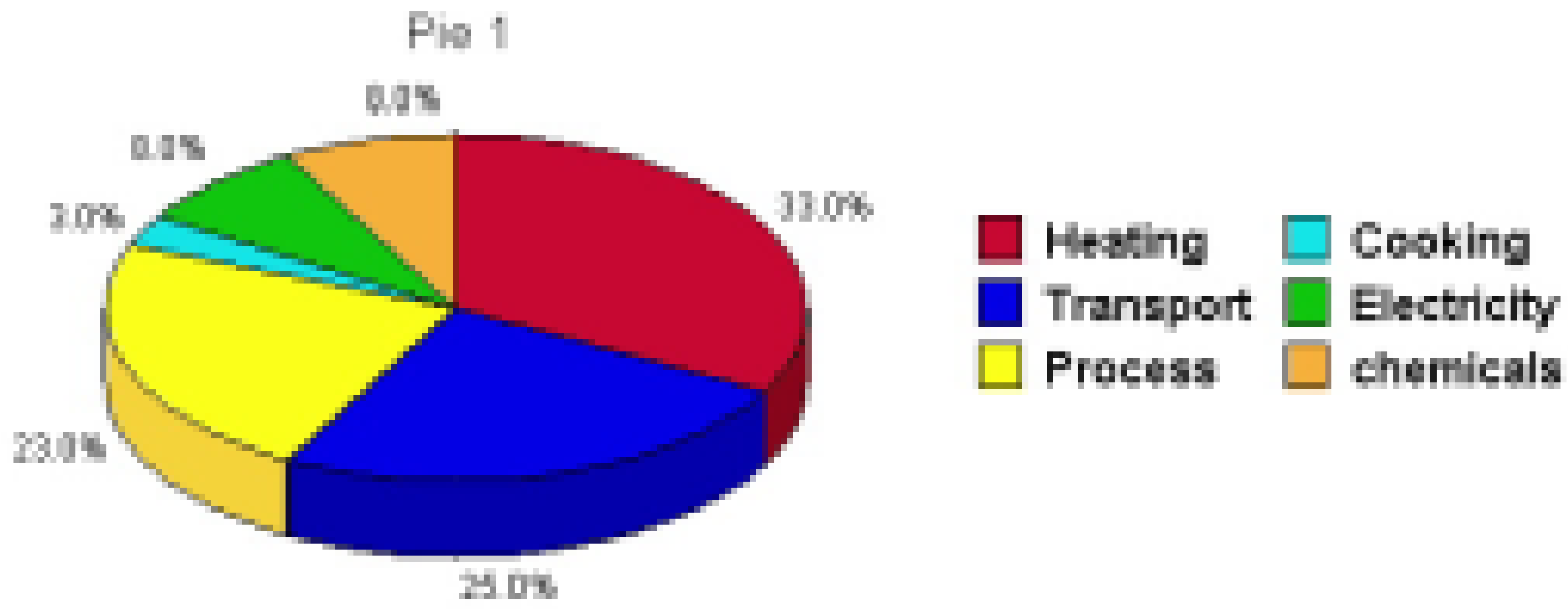

Babington Burner Made from 1½" Pipe.
See Itty Bitty Babington Text file for details.
Flame Holder
Valve
3 or 4 turns of 1/4" copper tube.
Oil in
Air In
1/4" rod legs. 4 Required
Oil Head pressure Assy.
From Oil Return Pump
To Oil Control Valve

BIOMASS


Blower Air Inlet
View "A"
Double Walled
Exhaust Flue
Cooled Fluid Return
Hot Fluid Output
View "A"
Oil Inlet
Compressed
Air Inlet
Oil Drain Back
10KV Spark Ignition
Electrode
Wast Vegetable Oil Tank


Babington Burner Made from 1½" Pipe.
See Itty Bitty Babington Text file for details.
Flame Holder
Oil Head
pressure Assy.

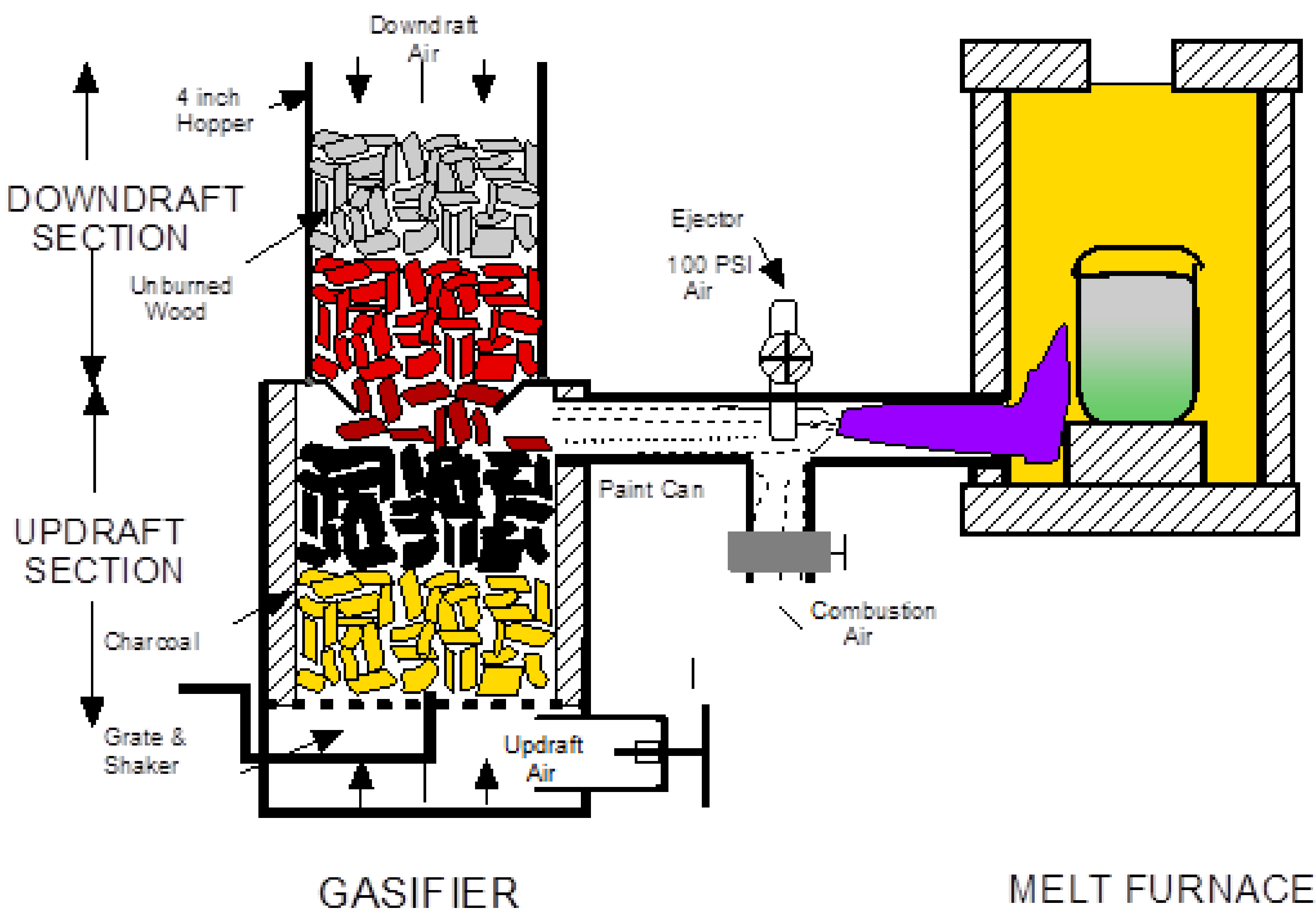
UK Energy End Use



Order of Magnitude
Data from 1990
AFS 24/11/2007


Beckett

THE UP-DOWNDRAFT GASIFIER FOR METAL MELTING
"THE DASIFIER"

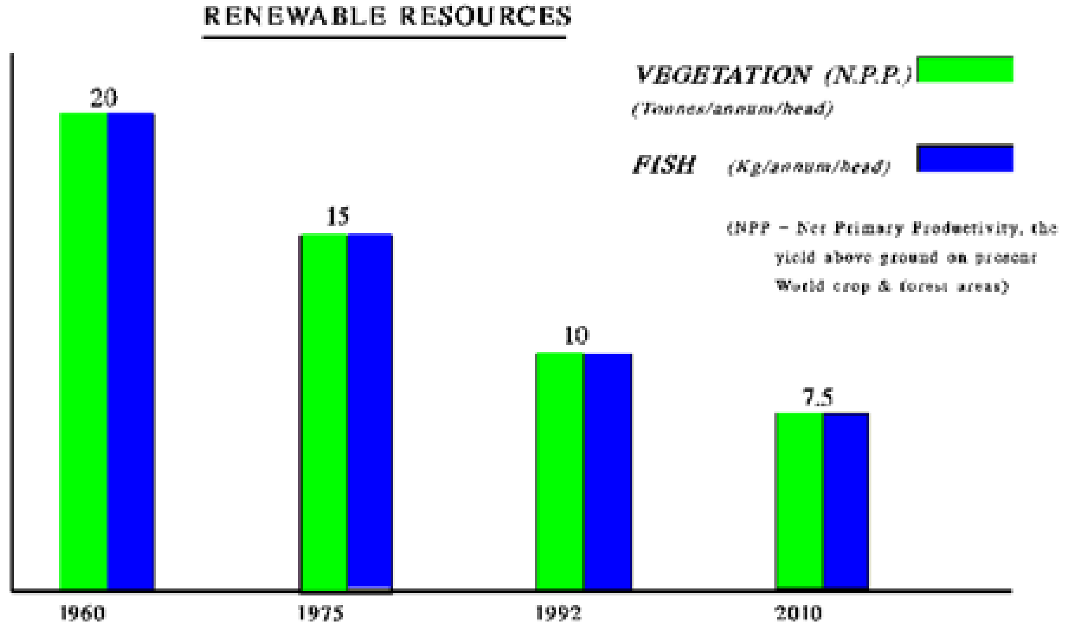


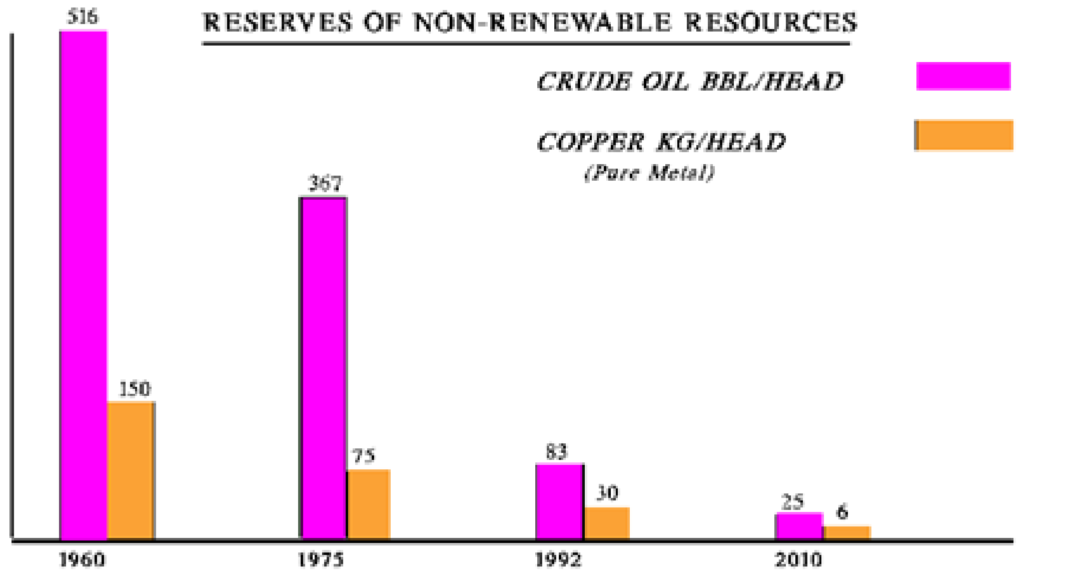

Beckett

ESTIMATE OF WORLD RESOURCES PER HEAD

(Source: The Real Wealth of Nations, by Dr.S.R.Eyre, Univ of Leeds, 1978, pub Arnold)

OR WHAT ARE WE ALL GOING TO LIVE ON AND WORK WITH ?



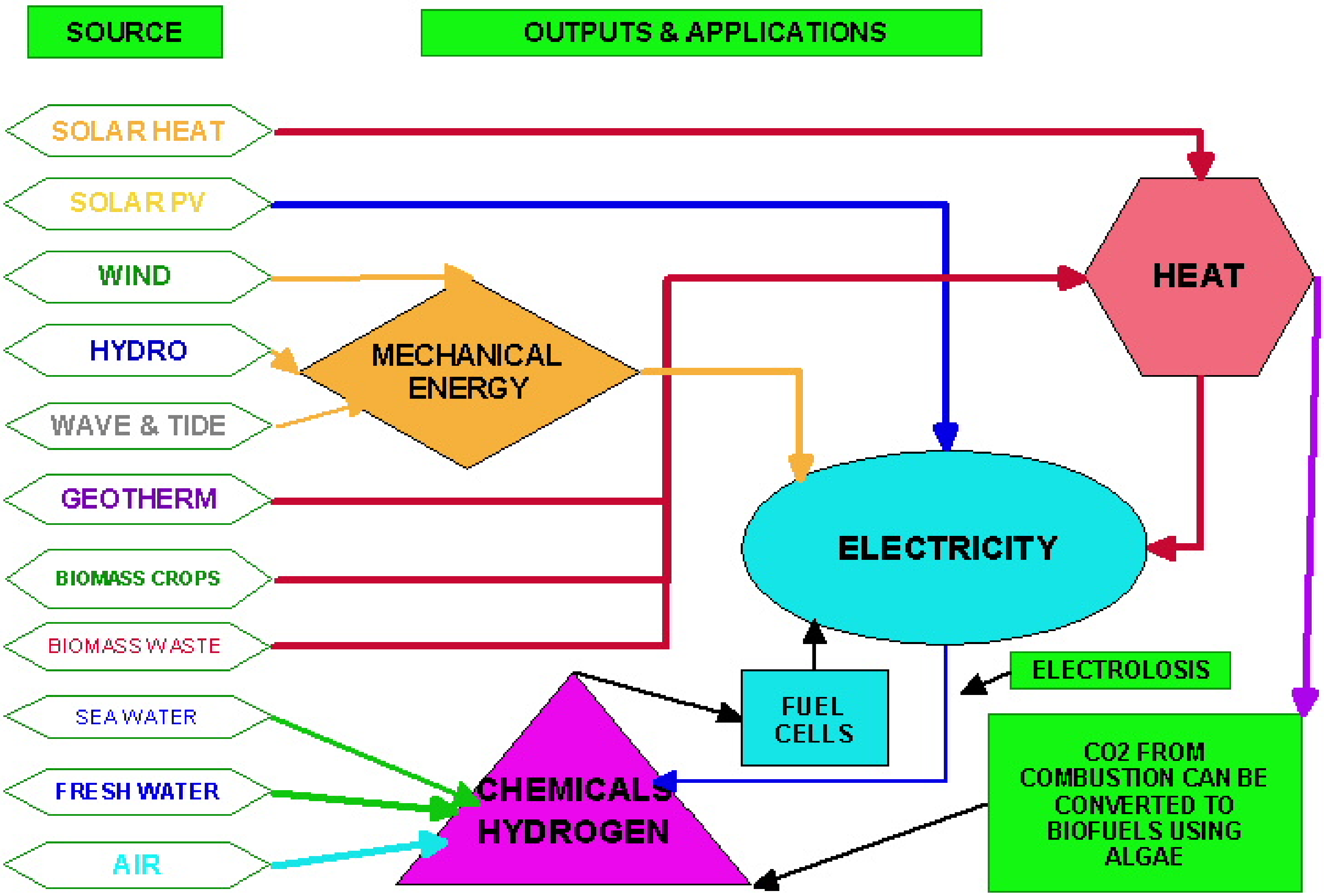


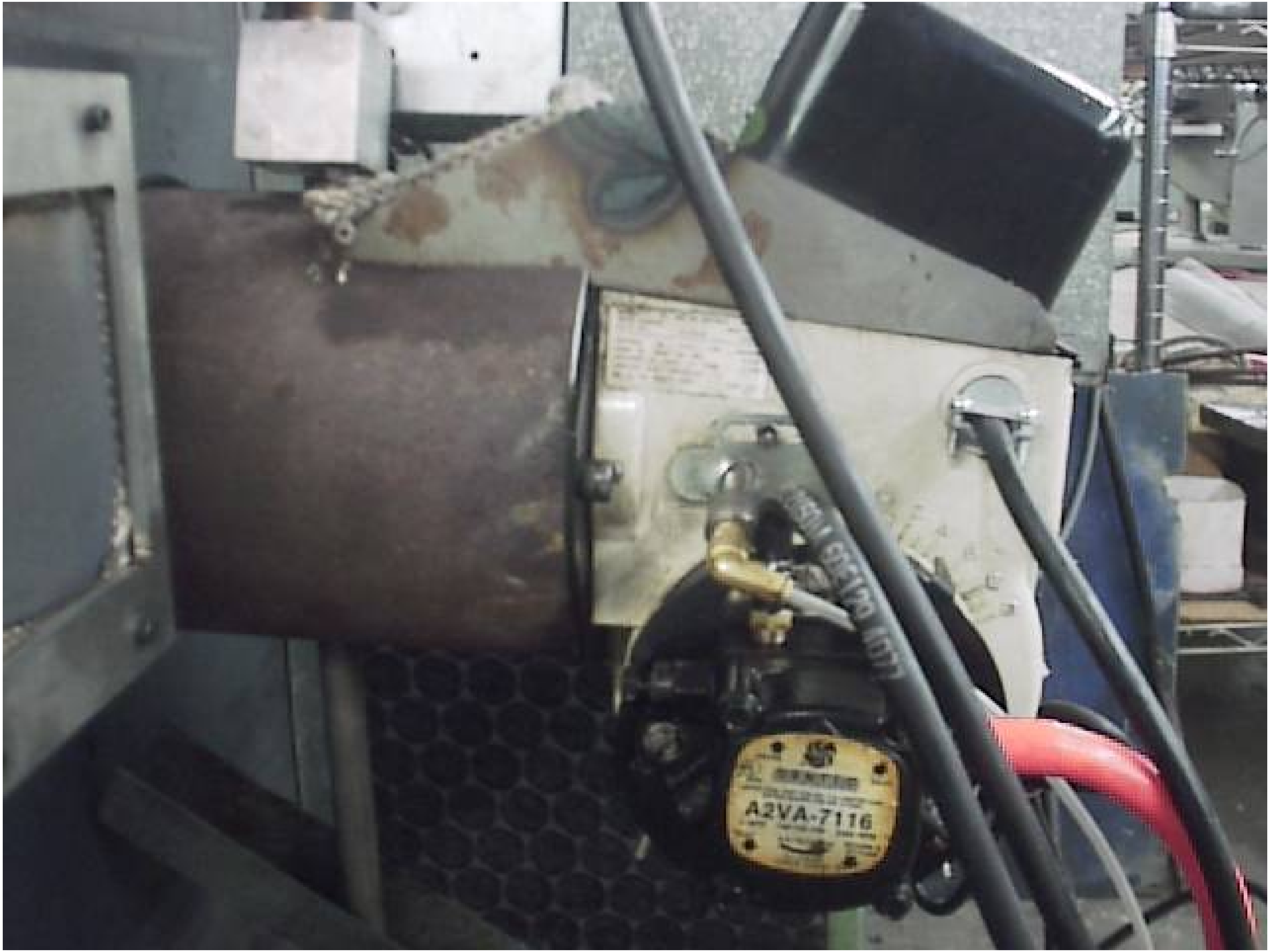
ESTIMATED WORLD POPULATION, MILLIONS

DRAWN BY A.STOBART

1960	1975	1992	2010
3000	4000	6000	8000

Renewable Energy, Sources & Applications

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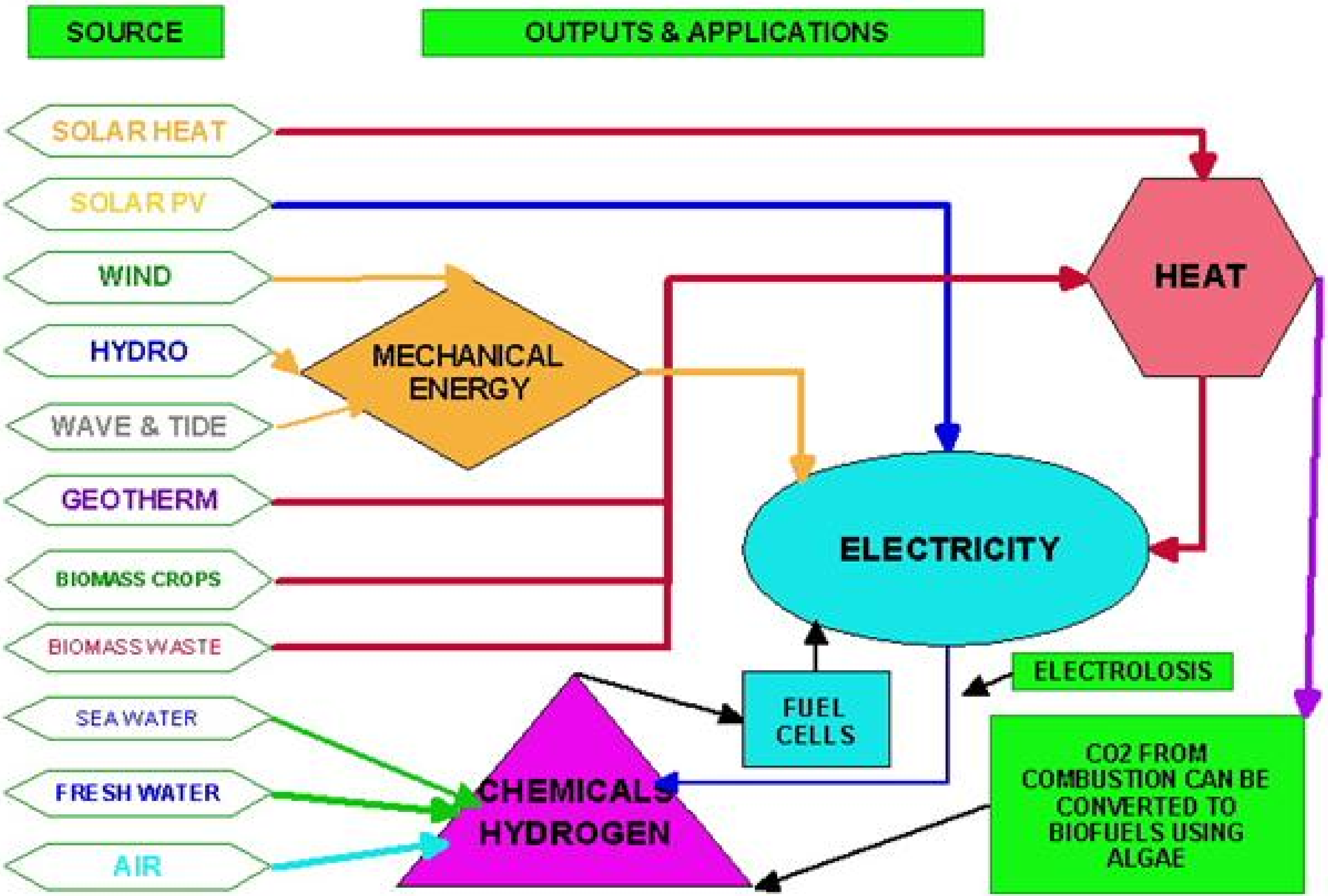
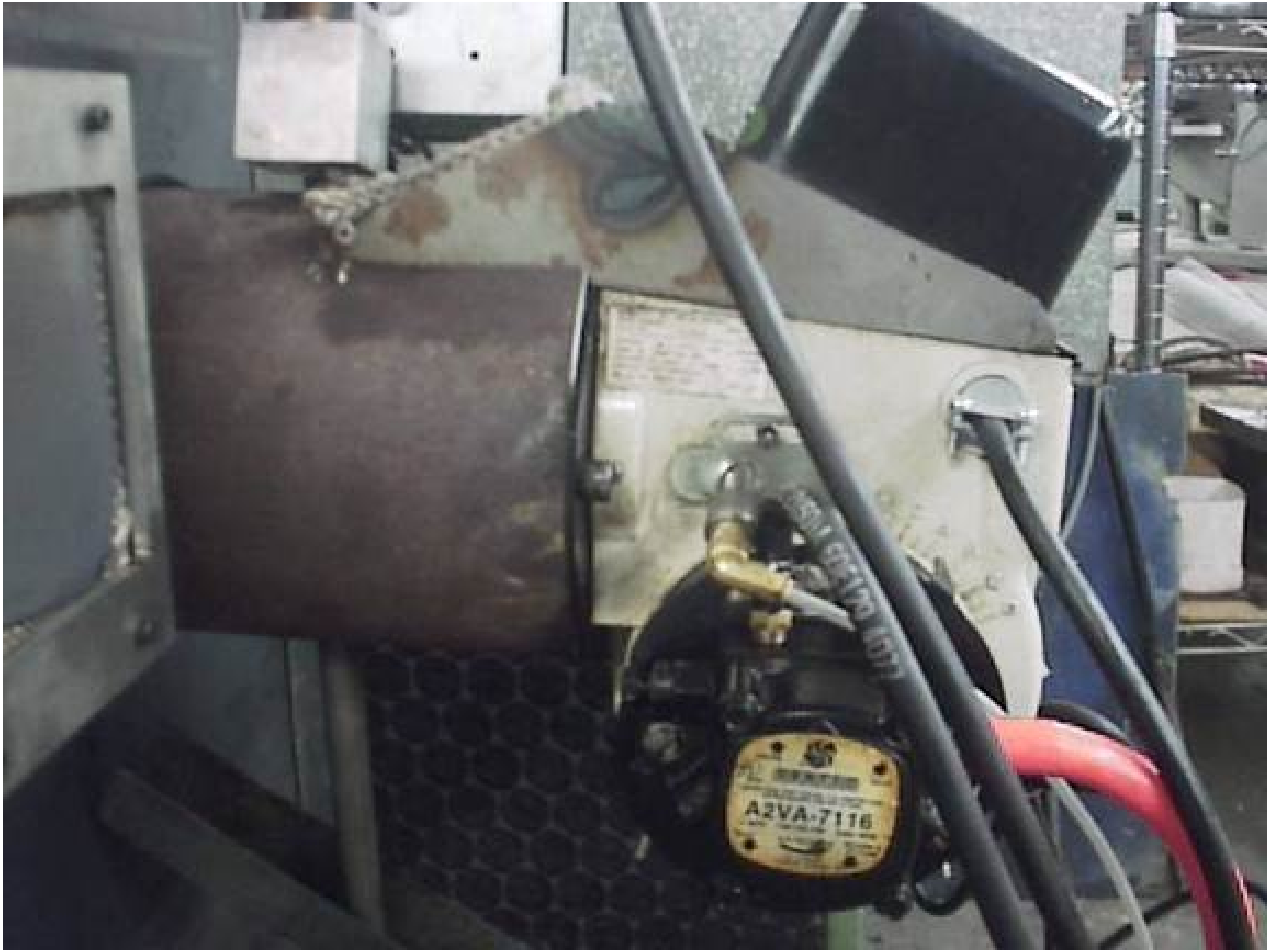
Renewable Energy, Sources & Applications

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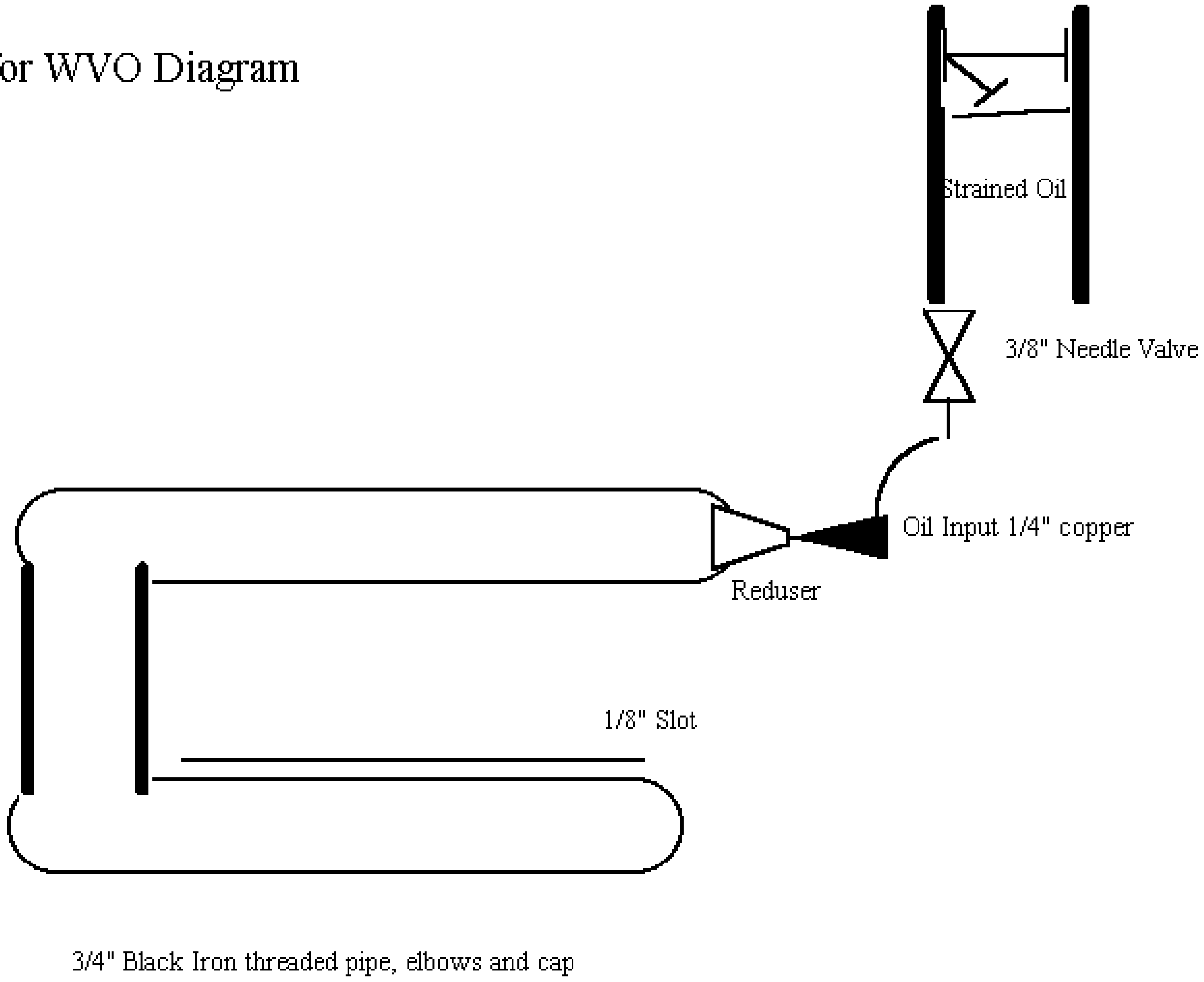
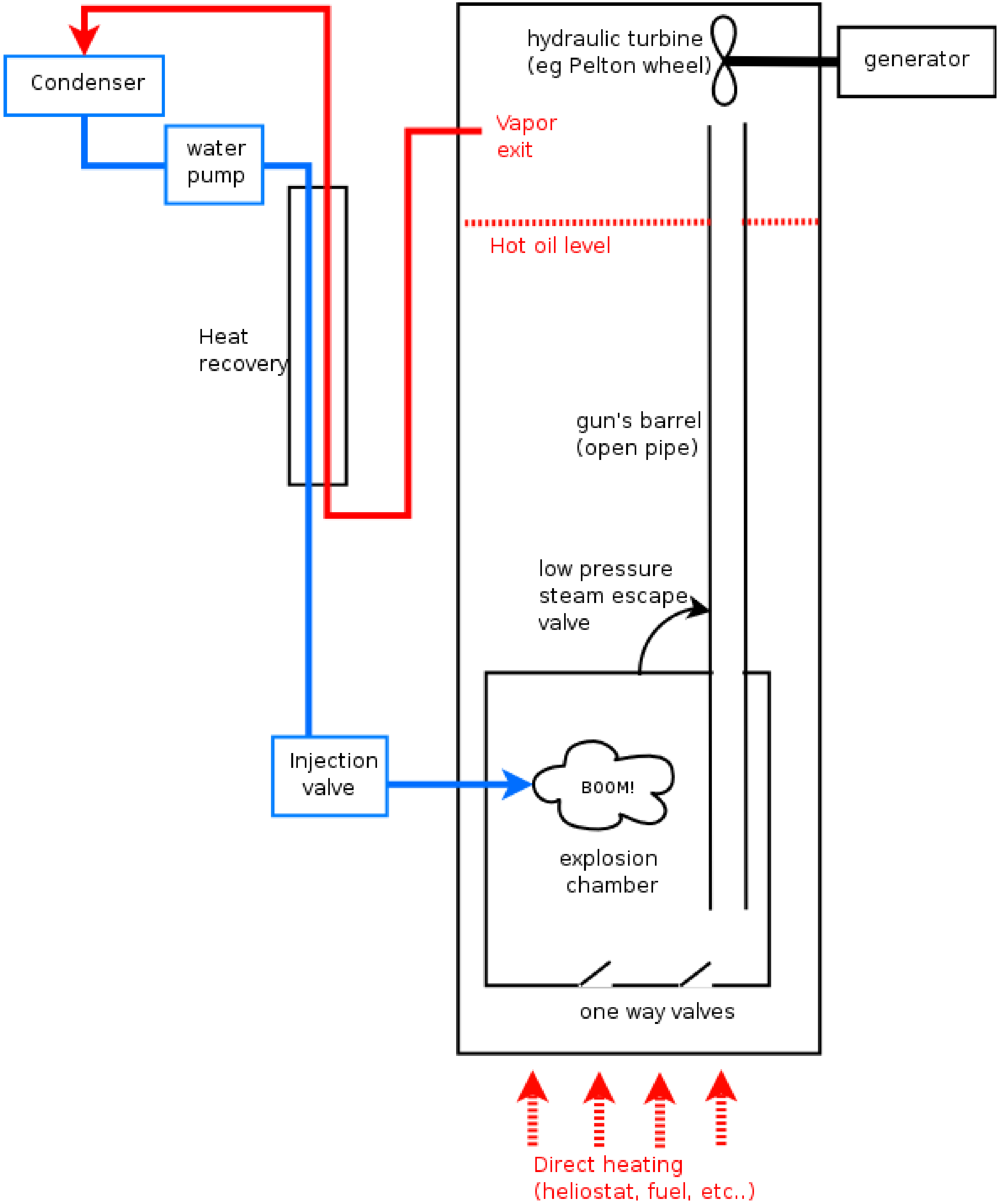
Thomas B. Reed


Honeyw

Pipe Burner for WVO Diagram



	CNG	Methanol	LNG	Ethanol	Propane	Gasoline	Diesel
Formula	CH4	C30H	CH4	C2H50H	C3H8	C8H16	C12H26
Research Octane #	130	112	130	111	112	91-98	N/A
Motor Octane #	130	91	130	92	97	82-90	
Cetane #	-10	3	-10	8	5-10	8-14	40-60
Boiling Point °F/°C	-259/-162	N/A	-259/-162	N/A	-44/-42	(81-464)/ (27-240)	N/A
Energy Content (volume) (BTU/ft^3) / (kJ/L)	213,300/ 7,875	425,000/ 15,688	569,200/ 21,013	570,000/ 21,027	637,500/ 25,535	862,100/ 31,825	950,400/ 35,082
Energy vs Gasoline %	25	49	66	66	74	100	110
Stoich A/F Ratio (mass)	17.3	6.5	17.3	9.0	15.7	14.7	15.0
Autoignition Temperature °F/°C	842/450	N/A	842/450	N/A	1,004/540	428/220	437/225
Peak Flame Temperature °F/°C	3,254/ 1,790	N/A	3,254/ 1,790	N/A	3,614/ 1,990	3,591/ 1,977	3,729/ 2,054
Flammability Lower Limit (volume %)	5.3	4.0	N/A	N/A	2.1	1.4	N/A
Flammability Upper Limit (volume %)	15.0	75.0	N/A	N/A	10.4	7.6	N/A


Condenser
water pump
Heat recovery
Injection valve
hydraulic turbine (eg Pelton wheel)
generator
Vapor exit
Hot oil level
gun's barrel (open pipe)
low pressure steam escape valve
BOOM!
explosion chamber
one way valves
Direct heating (heliostat, fuel, etc..)