

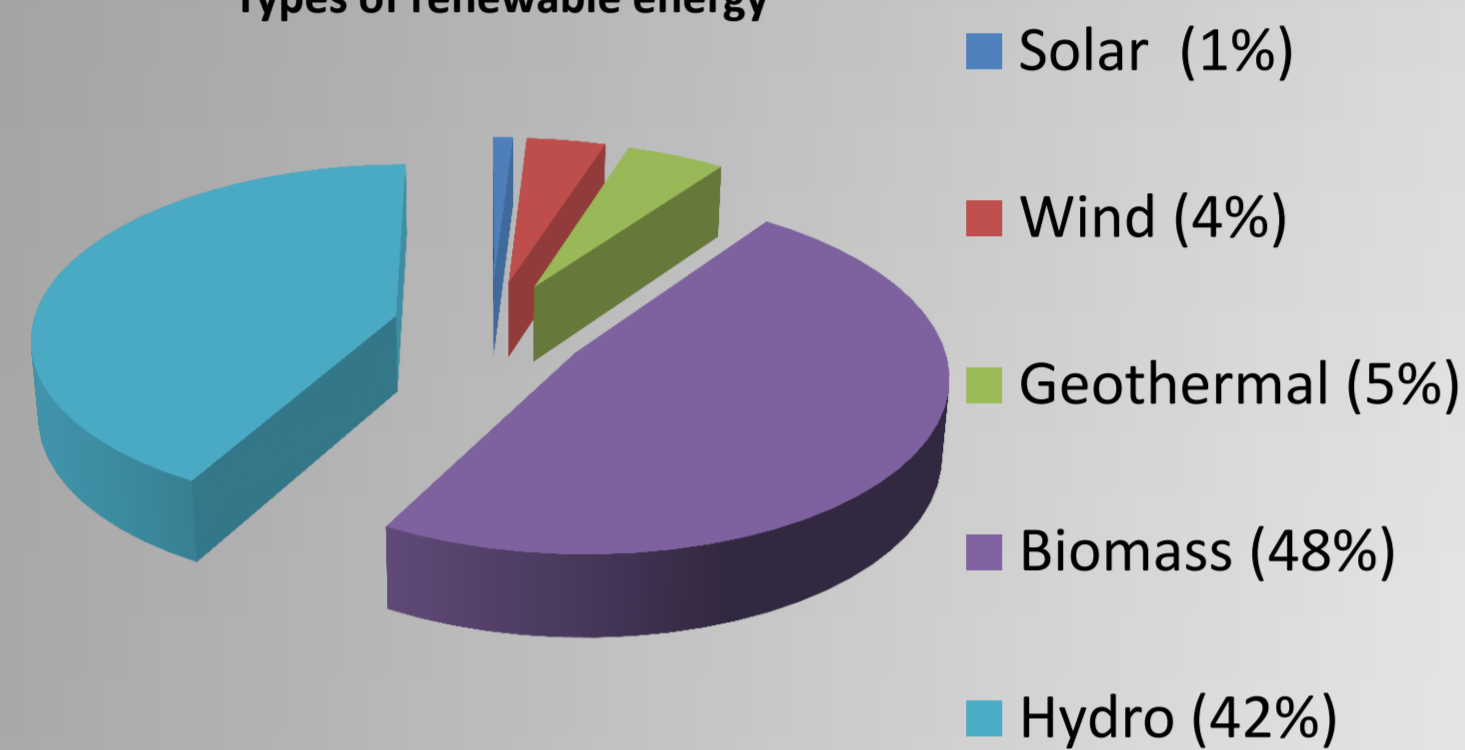
Renewable sun power

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Introduction

- There are several types of renewable energy
- Only a little percentage is solar energy

Types of renewable energy



Results

Turbine

8.9kW

Evaporator

196 pipes
Water: 1.2kg/s
R245fa: 0.4kg/s

Condenser

90 pipes
Water 4.1 kg/s
R245fa: 0.4 kg/s

Pump

1.8kW
0.4kg/s

Working fluid

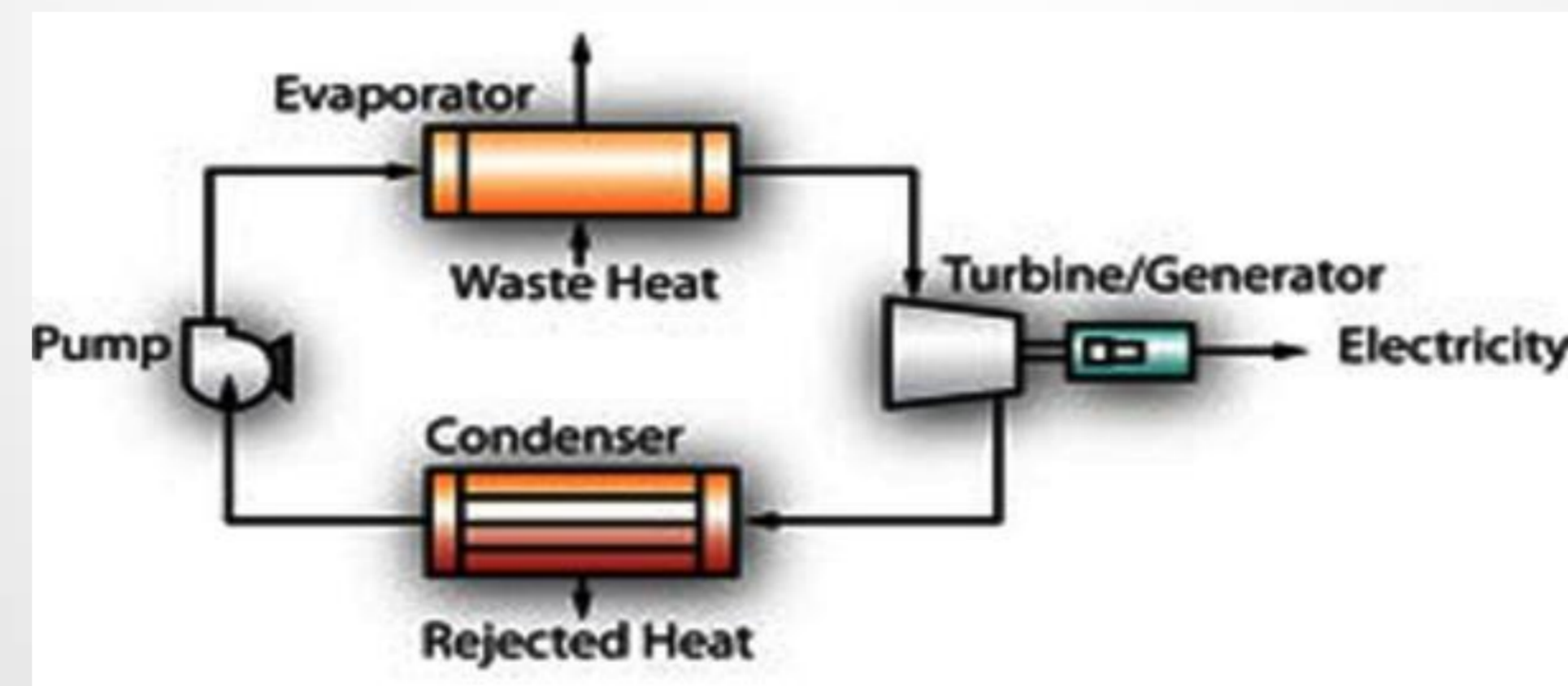
Water
Treated water
R245fa

Goals

- Main goal: Design and calculate a complete ORC system based on sunpower
- Sub goals: Calculate the condenser and the evaporator
Find standardized condenser and evaporator
Find matching generator and pump

Research

ORC cycle



Research

	Parabolic Trough	Dish/Engine	Power Tower
Size Power Output	30-320 MW	5-25 Kw	10-200 MW
Operating Temperature (°C/°F)	390/734	750/1382	565/1049
Peak Efficiency	20%	29.4%	23%
Net Annual Efficiency	11-16%	12-25%	7-20%
Technology Development Risk	Low	High	Medium
Hybrid Designs	Yes	Yes	Yes
Cost USD/W	2.7-4.0	1.3-12.6	2.5-4.4

FLUID	ELECTRICITY (kWh/year)	REVENUE (\$)	PAYBACK PERIOD (YEAR)
R245fa	13447	5244,33	3,74
R123	14747	5751,33	3,88
R141b	13699	5342,61	3,72
Ethanol	12662	4938,18	3,85



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