Natural Resources Planning Decision Support Model

SAND2011-0499P

Model Inputs

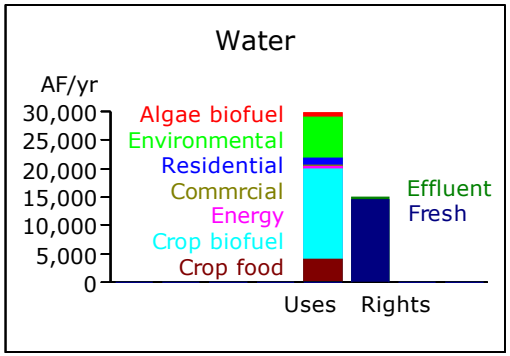
- Demographics
- Land Use
- Water Use
- Energy Use
- Energy Generation

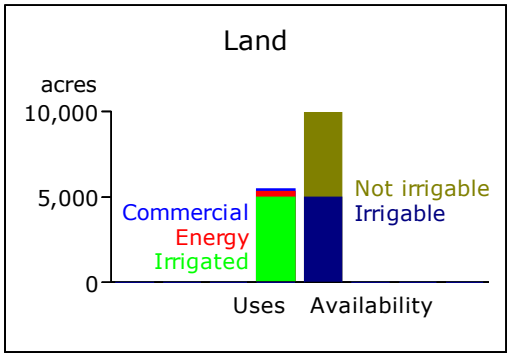
Current population	Population growth rate	Planning period
10,000 people	2 %/yr	10 yr

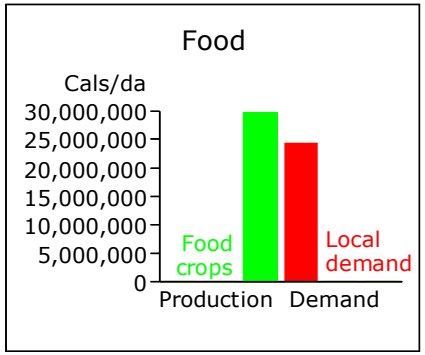
Model Outputs

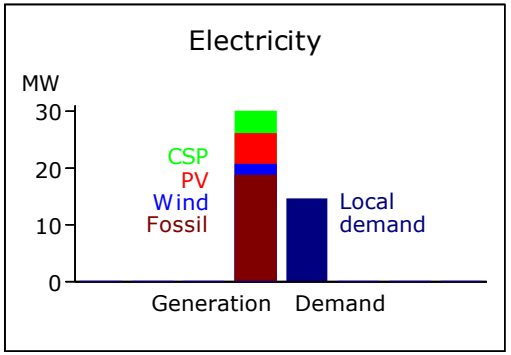
- Land water energy inventory
- Economics
- Cultural values

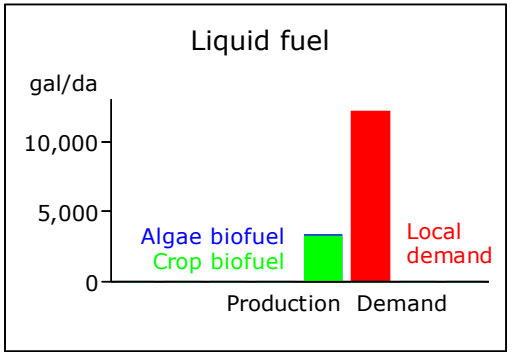
Rescale Plots











Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Natural Resources Planning Decision Support Model

Model Inputs

- Demographics
- Land Use
- Water Use
- Energy Use
- Energy Generation

	Land Resource
Total	10,000 acres
Irrigable	5,000 acres
Commercial	500 acres
Residential	1,000 acres
Other	3,500 acres

% irrigable land used: 100 %

% commercial land used for energy generation: 70 %

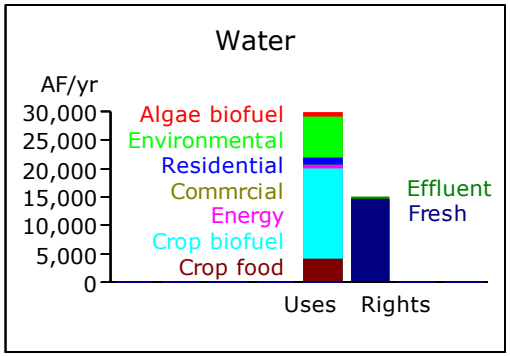
Irrigated area: 5,000 acres

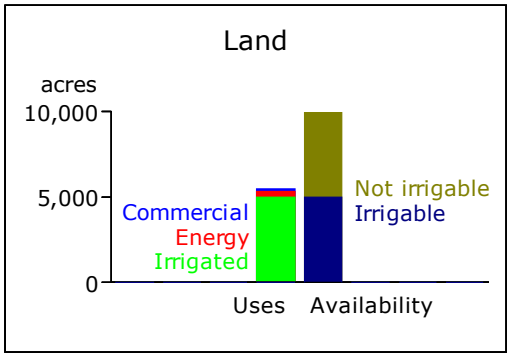
Commercial land used for energy generation: 350 acres

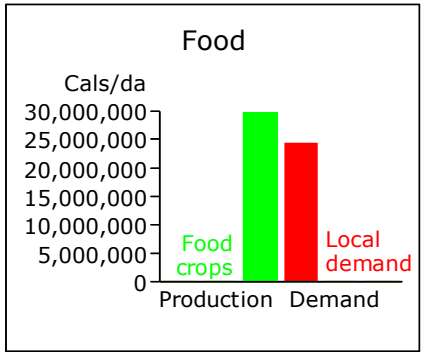
Model Outputs

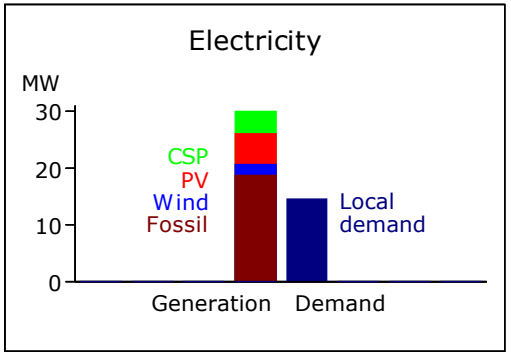
- Land water energy inventory
- Economics
- Cultural values

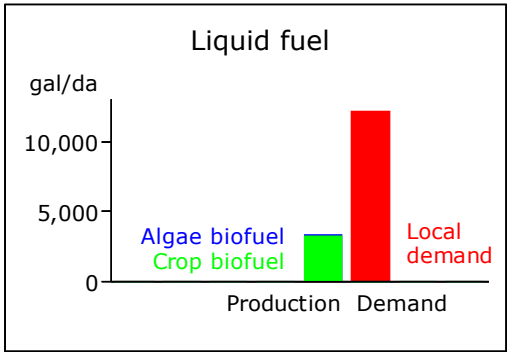
Rescale Plots











Sandia National Laboratories

Natural Resources Planning Decision Support Model

Model Inputs

- Demographics
- Land Use
- Water Use
- Energy Use
- Energy Generation

	Water Use Rates
Irrigation	4 ft/yr
Residential	100 gal/person/da
Energy Cooling	0.6 gal/kWh
Other Commercial	400 gal/acre/da
Algae Biofuels	5,000 gal/gal biofuel
Environmental	10 cfs

Total Water Rights

15,000 AF/yr

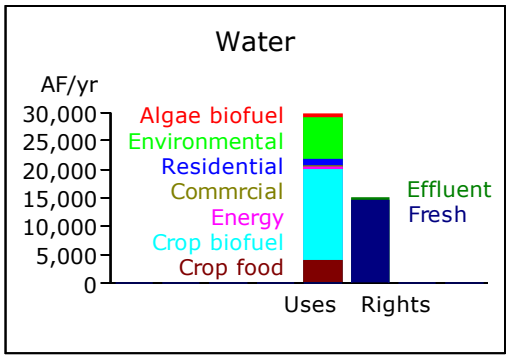
Effluent Rights

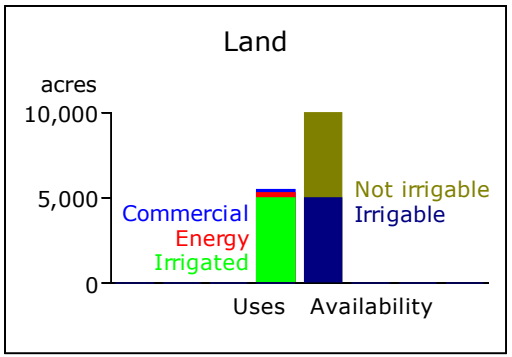
500 AF/yr

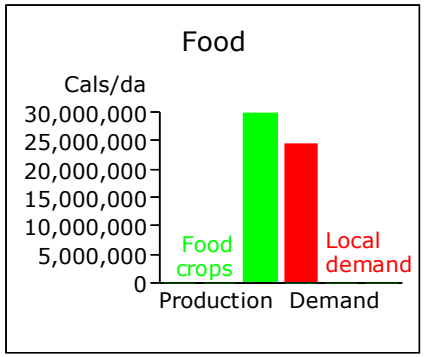
Model Outputs

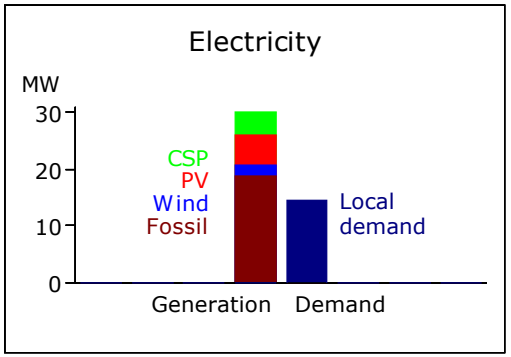
- Land water energy inventory
- Economics
- Cultural values

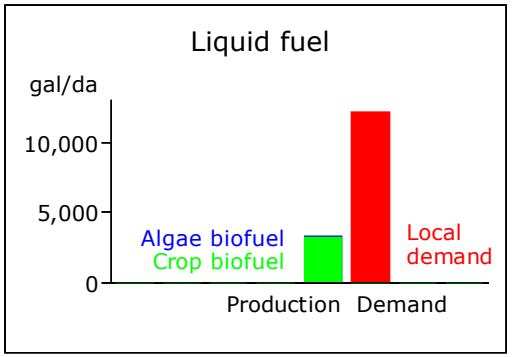
Rescale Plots











Sandia National Laboratories

Natural Resources Planning Decision Support Model

Model Inputs

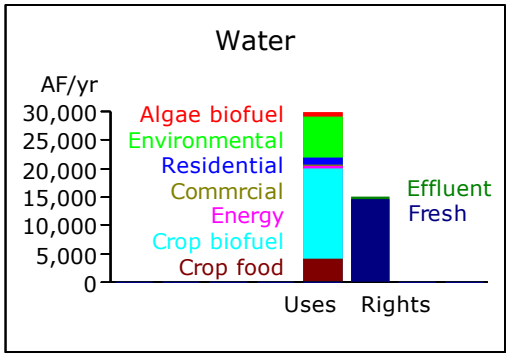
- Demographics
- Land Use
- Water Use
- Energy Use
- Energy Generation

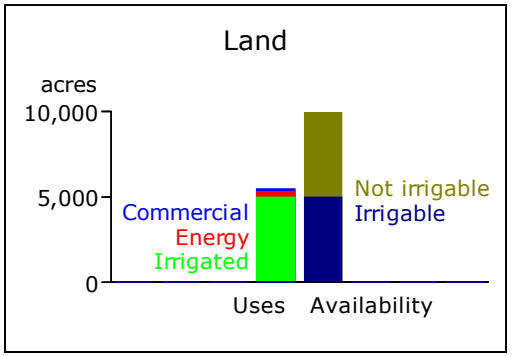
Per capita electricity use	Per capita gasoline use	Per capita calorie demand (food)
28.8 kWh/person/da	1 gal/person/da	2,000 Cals/person/da

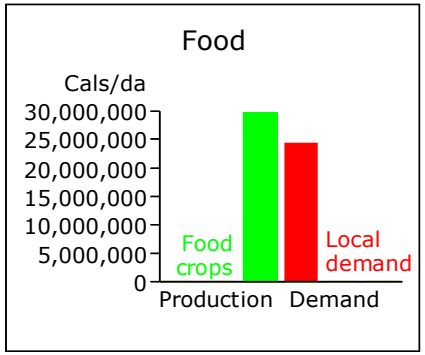
Model Outputs

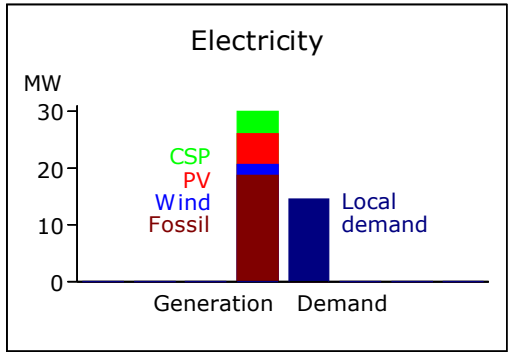
- Land water energy inventory
- Economics
- Cultural values

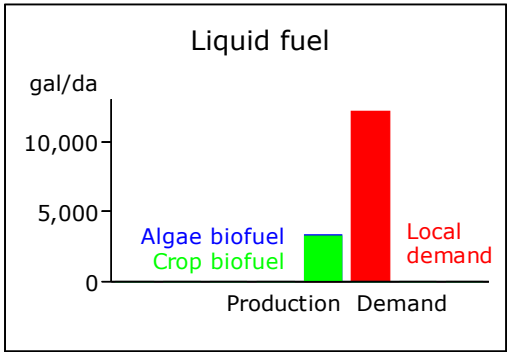
Rescale Plots











Sandia National Laboratories

Natural Resources Planning Decision Support Model

Model Inputs

- Demographics
- Land Use
- Water Use
- Energy Use
- Energy Generation

	Energy Potential	Area Dedicated
Fossil	2,200 kW/acre	10 acres
Wind	20 kW/acre	500 acres
PV	133 kW/acre	100 acres
CSP	100 kW/acre	100 acres
Food crops	10,700,000 Cals/acre/yr	1,000 acres
Crop Biofuels	288 gal biofuel/acre/yr	4,000 acres
Algae Biofuels	100 gal biofuel/acre/yr	500 acres

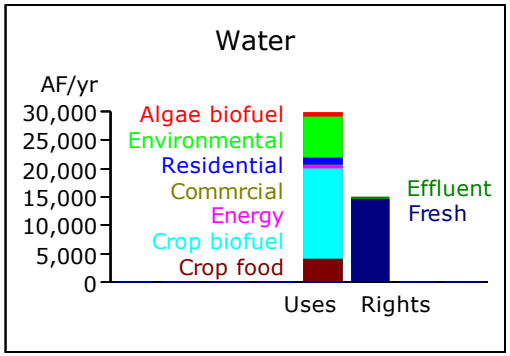
Total fossil resource

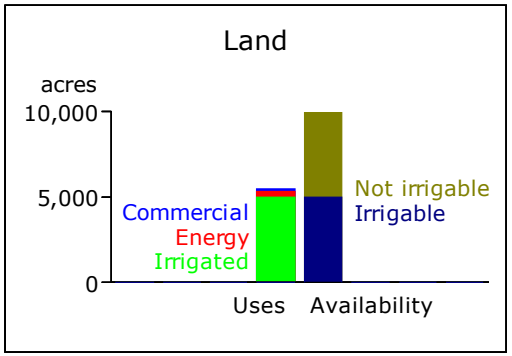
1,000 GWh

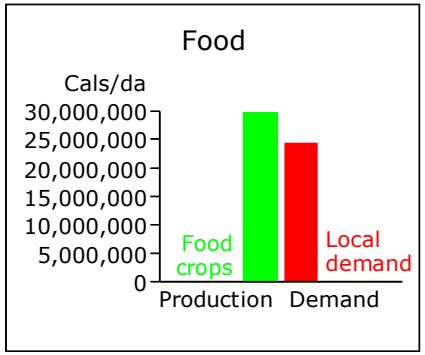
Model Outputs

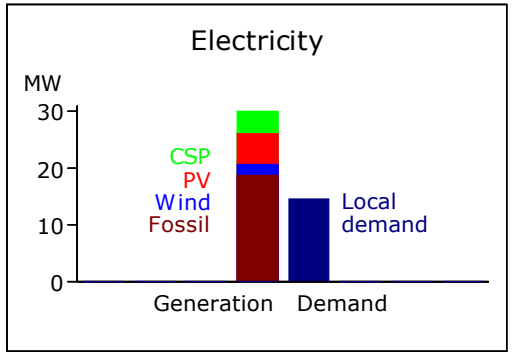
- Land water energy inventory
- Economics
- Cultural values

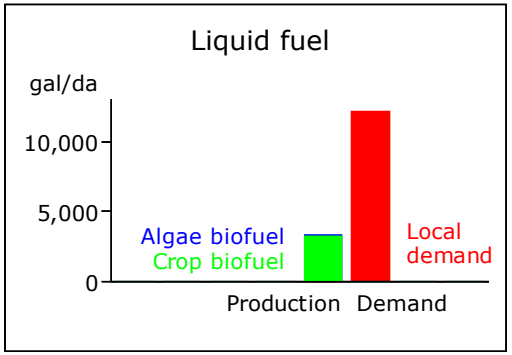
Rescale Plots











Sandia National Laboratories

Natural Resources Planning Decision Support Model

Model Inputs

- Demographics
- Land Use
- Water Use
- Energy Use
- Energy Generation

Current population	Population growth rate	Planning period
10,000 people	2 %/yr	10 yr

Model Outputs

- Land water energy inventory
- Economics
- Cultural values

Economic output under construction

Sandia National Laboratories

Natural Resources Planning Decision Support Model

Model Inputs

- Demographics
- Land Use
- Water Use
- Energy Use
- Energy Generation

Current population	Population growth rate	Planning period
10,000 people	2 %/yr	10 yr

Model Outputs

- Land water energy inventory
- Economics
- Cultural values

Cultural values output under construction

Sandia National Laboratories