Energy Resources and the Transition to a Clean Energy Future

Part 2

Below are excerpted paragraphs with source page references from the 22-page national Sierra Club *Energy Resources Policy*, which can be reviewed in full at: https://www.sierraclub.org/sites/default/files/Energy-Resources-policy_0.pdf

The Sierra Club analyzed available and potential energy options and ranked them according to the pollution they cause, their global warming emissions, their effect on the land, the energy used to produce them and the waste they create. The Sierra Club also assessed the ability of these options to reduce the use of fossil fuels, speed the transition toward an affordable energy economy and minimize damage to human health and natural systems. Many technologies and programs are ready to make a major contribution now, but others need time for significant research and development. (P. 11)

Energy Efficiency

Energy efficiency – using improved technology and operations to deliver the same energy services with less fuel – is the foundation on which all of our other recommendations are based. The efficiency programs outlined below can be implemented now and make a substantial, immediate contribution to reducing energy use and greenhouse gas emissions. Moreover, they can save money and provide high-quality jobs. Programs already exist in some states, but they must be expanded without delay. The Sierra Club identifies these key approaches for immediate action:

1. Clean, Efficient Vehicles

Decrease CO_2 emissions from passenger vehicles through a combination of electrification, more efficient engines and vehicle design, and if they can genuinely be produced sustainably, biofuels. Increase vehicle efficiency by raising standards for cars and light trucks to at least 60 mpg by 2025 and 143 grams/mile CO_2. Promote rapid expansion of electrification in passenger vehicles and truck fleets. Standards for the full range of trucks must continue to improve after the initial 2014-2018 standards. These standards must encourage hybrid and other advanced technologies. (P. 11)

2. More Efficient Transportation Modes

Adopt a concerted national program to enhance the rail system to shift freight and intercity passenger transportation away from highway use and aircraft. Railroads move freight much more efficiently than trucks and aircraft and moving freight from trucks to rail will reduce damage to existing roads. Transportation produces one-third of all CO_2 emissions in the United States. Effective and affordable transportation is essential to a modern society, so substantial changes will be needed to reduce energy use and dramatically decrease CO_2 and other greenhouse gas emissions. These changes must occur in four basic areas: vehicles, fuels,

alternative modes and changes in travel patterns. The heavy transportation industry is very sensitive to energy prices and has already invested substantially in energy efficient trucks, trains, airplanes and watercraft. (P. 11)

3. More Efficient Communities – in both new and existing development footprints
The following policies should govern both new development and be applied wherever feasible to our existing developed areas:

Reduce the need to drive passenger vehicles by shortening the distance between workplace, home, shopping and school, using "smart growth" planning and improved transportation options. Provide safe and appealing options for walking, bicycling and mass transit, including light rail passenger trains, which will reduce vehicle trips, emissions, fuel consumption, and the demand for new roads and pavement. Well-designed mixed-use communities create long-term reductions in energy usage. Appropriately designed public transportation systems are an essential component of a sustainable energy society. (P. 12)

4. Building and Appliance Efficiency Standards
Adopt a three-step market transformation strategy: (a) significantly tighten building energy codes and appliance efficiency standards; (b) promote programs to encourage above-code energy efficiency and sustainable building construction such as the LEED program (Leadership in Energy and Environmental Design); and (c) develop mechanisms that spread the use of best practices going beyond current building energy codes.

5. Clean Energy Funding
Funding for energy efficiency incentives and assistance with financing are vitally important for wide deployment of energy efficiency. The Sierra Club supports providing revenues to well-managed energy efficiency programs, and to on-bill or other methods of financing for building owners, using utility revenues, government funding, tax credits, and other effective measures.

6. Distributed Generation
While distributed generation is discussed in Section B below, it is included here because it also can make a significant contribution to system efficiency. Distributed generation can reduce the distance needed for transmission and distribution of power to decrease transmission losses and improve grid stability and reliability. Many opportunities exist in our communities for the local, small-scale application of renewable technologies (such as rooftop solar) or the efficient use of waste heat from fuel use (combined heat and power). (P. 12)

B. Resources Preferred by the Sierra Club

The Sierra Club prefers the following energy supply options. Combined with conservation and efficiency measures, these resources have the greatest potential to decrease greenhouse gas emissions, contribute to a stronger economy, and reduce environmental damage and harm to human health. Our society should seek maximum reliance on these technologies. It is especially important to provide support for renewable energy resources through the use of renewable

portfolio standards, advanced renewable tariffs, public benefit funding, tax-based incentives, feed-in tariffs and other policy tools at the local, state and national level to promote these renewable energy resources. (P. 13)

Most of these preferred resources are renewable electricity generation sources which can have significant environmental impacts. Within the context of general support for prompt development of all these types of preferred energy sources, the Sierra Club will endeavor to reduce their environmental impacts through improved siting and other forms of mitigation. For some individual cases the Sierra Club may determine that adverse impacts are of such a degree that it will oppose the particular project unless the impacts are reduced.

Decisions to oppose a specific facility in a preferred resource category must be justified with a detailed description of the significant environmental harm. When the Sierra Club opposes a particular project in the preferred category, it should always make clear that opposition is based on the location or other project-specific characteristics, and that the Sierra Club generally supports reliance on these energy resources.

Difficult and complex judgments may be necessary to determine whether or not a particular renewable energy project is sited too poorly or otherwise has unacceptable impacts. However, the Sierra Club is certain that failure to develop a broad, geographically diverse suite of these preferred renewable resources will cause irreversible harm to the natural values we care about. Before the Club takes a position on a project, whether to support or to oppose, it will consult with its campaigns and the appropriate chapters or other local entities. As appropriate, it may be helpful to outline specific procedures for this consultation from time to time. (P. 13)

1. Community Renewables, Distributed Generation

Many opportunities exist in and adjacent to our communities for the local, smaller-scale application of renewable technologies (such as rooftop solar). Distributed clean energy involves the entire community in energy solutions, and reduces transmission impacts and disruptive transmission bottlenecks. The Sierra Club supports properly sited and designed local and district energy projects, and calls for measures to ensure that local, smaller-scale projects have access to the transmission and distribution system. Because distributed generation generally takes place in an urban or otherwise developed environment, serious siting problems or unacceptable environmental impacts are uncommon.

Small-scale photovoltaic (PV) electric power and solar thermal heating systems are already used widely. On-site solar can provide substantial residential and commercial energy even in high latitudes and cloudy climates, and reduces transmission and land use requirements. Active and passive solar design and siting can be used to provide heating and cooling in residential and commercial buildings and can play a key role in industrial processes. (P. 13)

2. Onshore and Offshore Wind

Wind power is widely available and the industry has matured rapidly in the last decade. While output from individual wind turbines varies based on daily and seasonal weather, at the regional scale wind power is a clean, consistent, reliable and safe energy resource. The Sierra Club strongly supports direct use of wind energy. (P. 14)

Wind energy systems may have noticeable visual impacts and can disturb sensitive or endangered plants and wildlife. Existing wind energy systems with significant impacts on avian and bat populations should be modified to mitigate those impacts; if modifications prove to be ineffective, turbines should be curtailed or dismantled. Locations with lesser impacts should be sought for new projects. Offshore sites may have access to a superior wind resource, but may disturb coastal and marine environments. In general, the environmental impacts of wind energy systems should be reduced through careful technology choice, siting, reliable pre-construction monitoring, and operations. The Sierra Club supports further research, both general and site-specific, and development of new technologies, to minimize and mitigate impacts of wind energy systems. (P. 14)

(The Sierra Club's Wind Siting Advisory contains further guidance.)

3. Central Station Solar

There are several types of utility-scale solar electric generation including photovoltaic, high-temperature concentrating solar trough and tower systems, and low-temperature solar thermal. Solar energy is well matched to daily and seasonal energy demand. As costs continue to drop, solar generation will become a prominent national energy resource.

4. Combined Heat and Power

Efficient CHP systems produce both electricity and steam or other useful heating or cooling services, providing the most value and least pollution from a fuel source. Use of the waste heat from industrial processes decreases on-site energy requirements for grid power and may provide off-site supply. In conjunction with smart development of city and town centers, district energy systems can provide both electricity and usable heat. Note: Sierra Club support for CHP does not change our opposition to coal-fired power plants.

5. Low-Temperature Geothermal

Low-temperature geothermal energy uses the Earth's own heat for building and district heating and cooling, and can provide an effective residential and neighborhood energy supply. (P. 14)

C. Resources Generally Acceptable to the Sierra Club

Resources in this category should play a role in a clean energy future, but they have larger potential environmental costs than resources in the preferred category. Sierra Club entities may

support or remain neutral on projects employing these technologies. Sierra Club entities always may oppose an inappropriate site or project. Since the resources in this category are less desirable technologies, criteria may be more restrictive than for preferred resources. However, when the Sierra Club opposes a particular project, it should always be made clear that opposition is based on the location or other project specific inadequacies, and that the Sierra Club generally supports further reliance on these energy resources. (P. 15)

1. New Small Hydroelectric Plants

While significant numbers of sites could be developed for small-scale hydro, each site must be considered for its local and cumulative effects on water quantity and quality, minimum streamflow, habitat, and fish passage. All installations must provide full mitigation for any detrimental effects. Some stream segments should not be developed at all in order to preserve the benefits of free-flowing rivers. The Sierra Club opposes installations in stream segments proposed for listing as federal or state Wild and Scenic Rivers or in roadless areas. (P. 15)

2. Ocean Energy Resources

Ocean energy includes tidal power, wave power, ocean current power, and thermal energy projects. The ocean energy resource is very large, widely available and renewable, but the available technologies for capturing the energy are still in development and their environmental impacts are not well characterized, but could potentially affect marine and coastal resources. Careful development with tight controls over siting and operation will be necessary for commercial-scale facilities. (P. 15)

3. High Temperature Geothermal

Geothermal energy is a resource with almost no greenhouse gas emissions. For conventional hydrothermal (steam or hot water) resources, modern re-injection designs nearly eliminate toxic emissions, particularly hydrogen sulfide, and sustain the resource for far longer. Since geothermal resources are often associated with significant surface features such as geysers, volcanoes and hot springs, and tend to be in sensitive areas, siting criteria are crucially important. The potential for geothermal energy from hot dry rock resources is much larger than hydrothermal resources, but the technology to extract energy from these resources has not developed beyond the pilot stage. (P. 15)

D. Bioenergy

Biomass energy (or "bioenergy") is the use of organic materials to be burned for heat and/or electric power, or converted to liquid fuels (often called "biofuels"). (P. 16)

Bioenergy must be considered in its broad environmental context, not merely as a one-for-one fossil fuel substitute. Many claims for the "sustainable" and "carbon neutral" nature of bioenergy are untrue. The Club opposes further deployment of corn-based ethanol based on its extremely dubious net carbon benefits and its unresolved direct and indirect environmental

impacts. The Club also opposes proposals to use agricultural waste and residue products (e.g., corn stover) without rigorous evidence that the material being used is surplus to the needs of soil health and fertility. (P. 16)

Biofuels from sustainable feedstocks using appropriate production technologies and facilities can be an important ingredient in a clean energy future. Inappropriately located, poorly regulated or excessively large biofuel facilities can easily create environmental problems greater than those they solve. Air pollution, water pollution, land degradation, health impacts and the increased direct and indirect emissions of greenhouse gases are all serious risks. Despite these serious downsides, biofuels from sustainable feedstocks using appropriate production technologies and facilities may be an important ingredient in a clean energy future. (P. 16)