



SIERRA CLUB

FOUNDED 1892

Sierra Club Conservation Policies

Biomass Guidance

Issues surrounding the production of energy by combustion of biomass fuels are complex, sometimes contentious, and involve many different aspects of Sierra Club policy. This guidance is an interpretation of how our existing policies relate to biomass energy issues, rather than a new policy statement. Its purpose is to guide Sierra Club members and the public in understanding our views on many aspect of biomass.

This Guidance should be regarded as an assessment of common ground and concerns rather than a resolution of any of the stronger points of contention. It is intended to represent the best thoughts of informed and concerned Club members, and to provide activists with useful information, but concerning issues where both the processes in question and our understanding of them are changing and evolving rapidly, so that embodiment in Club Policy is inappropriate.

This guidance was prepared by members of the Club's Energy Committee and Environmental Quality Strategy Team (EQST), based on a listserv dialogue among Sierra Club members which lasted approximately six months, starting in October of 1999. The guidance was reviewed and approved by EQST and the Sustainable Planet Strategy Team, which oversees the work of the Energy Technical Advisory Committee, which replaced the Energy Committee at the end of 2000.

Sierra Club's Guidance on Biomass

Part I: Overview and Goals

Part II. Biomass and Forest Issues

Part III. Fuel Farming

Part IV Waste-to-Energy, Animal Waste, Agricultural Waste, Landfill Gas

Biomass affects a wide array of issues that have been of concern to the Sierra Club, and the following policy documents are referenced in this Guidance paper. They are available on the Club's [website](#), or from the Club's office in San Francisco and many other Sierra Club offices.

[AGRICULTURE POLICY](#)

[BIOTECHNOLOGY POLICY](#)

[FOREST POLICY](#)

[POLLUTION POLICIES](#)

[SITING ENERGY FACILITIES POLICY](#)

RIGHT-TO-KNOW *

RIGHT-TO-PARTICIPATE *

PRECAUTIONARY PRINCIPLE *

* These three items are part of the [ENVIRONMENTAL JUSTICE POLICY](#)

I. OVERVIEW AND GOALS

Biomass-energy production is the production of energy (electricity; liquid, solid, and gaseous fuels; and heat) from biomass. Biomass may be any organic matter including dedicated energy crops and trees, agricultural food and feed crop residues, aquatic plants, wood and wood residues, animal wastes and other organic waste including the aerobic and anaerobic break-down product of any organic matter and waste streams.

Biomass is considered by many to be a renewable source of energy that does not aggravate global warming because the carbon involved is functioning in a short cycle, and regrowth balances the emissions. However, unsustainable land use practices may release soil carbon to the atmosphere. Accelerated and poorly-managed harvesting of forests and crops as fuel accompanied by the conversion of natural ecosystems to fuel farms will increase global warming and degrade the environment.

We believe that biomass projects can be sustainable, but that many biomass projects are not. We are not confident that massive new biomass energy resources are available without risking soil and forest health, given the lack of commitment by governments and industry to preservation, restoration, and conservation of natural resources.

We are cautious in supporting projects based on "clean" construction waste, forest byproduct waste or sustainable waste such as municipal tree trimmings because of the strong incentives for plant managers to use unsustainable or contaminated fuel if the intended supply runs short.

The Sierra Club believes that energy use should be minimized through conservation and efficiency, and that sustainable, renewable energy resources be utilized for human needs. In the near future, efficiency is the only "energy source" which does not incur some environmental damage and which is available immediately in generous supply. Sophisticated building construction, efficient appliances, recycling, modernized industrial processes, "smart" buildings that turn off lights and lower the temperature in unused rooms, programmable thermostats, public transit supplemented by fuel-efficient cars, and many other innovative technologies can reduce energy use tremendously, usually while saving money.

Combustion for energy production is responsible for much of the world's air pollution and, indirectly through deposition, much of its water and land pollution as well. These pollutants, including smog, acid rain, and persistent bioaccumulative toxics, threaten human health and the global ecosystem. All fossil fuels and most biomass technologies aggravate global warming by producing CO₂. Unless very carefully managed, biomass operations may not be sustainable and may add to the CO₂ problem because of damage to soil health or failure to assure sustainable regrowth of the fuel stock. Biomass is in principle renewable, but native soils hold substantial carbon, mostly in root mass, and while it is possible to preserve soil carbon balances, conventional agricultural practices rarely do so.

Much of the debate surrounding biomass technologies involve assessing their environmental impact against the benchmark of coal-fired energy production. We are increasingly concerned that biomass projects may rely on, or create incentives for fuel derived from unsustainable forestry and agricultural practices. It can be appropriate to concede these concerns to gain a higher benefit in relation to fossil fuel, but we encourage biomass projects to hold their sources of fuel to high standards for sustainable land management.

Existing Sierra Club policy on SITING ENERGY FACILITIES requires that we oppose facilities which do not fully protect air and water quality. Opposition to projects where abusive practices are inherent, and/or where the project exists for no other purpose than to enhance extractive activities, is

entirely appropriate.

As local activists face these projects, it will be important to keep in mind Sierra Club's general principles on environmental issues: Sierra Club supports the public's RIGHT-TO-KNOW * the information necessary for informed environmental decision-making and their RIGHT-TO-PARTICIPATE * in the development of rules, regulations, and evaluation criteria and at every level of decision-making. Barriers to participation should be addressed. Environmental decision-making must include the full range of alternatives to a proposed action, including rejection of the proposed action.

We also support the PRECAUTIONARY PRINCIPLE * which is that when an activity potentially threatens human health or the environment, the proponent of the activity, rather than the public, should bear the burden of demonstrating to the satisfaction of those who may be impacted, that environmental impacts have been reduced to an acceptable level. Thus, any "done deal" for any energy facility which excludes the public from information, participation, and a means of evaluation is unacceptable.

II. BIOMASS AND FOREST ISSUES

Native Forests are presently the largest source of fuel for projects defined as biomass. In keeping with our FOREST POLICY, we oppose all biomass energy generation processes including fuel production which contribute to the destruction of existing forests, including national or native forests as well as remaining old-growth or roadless areas.

We oppose projects which rely upon ecologically destructive clear-cutting, in-wood chipping where excessive amounts of biomass are removed from the land, and conversions to non-native species which undermine native biodiversity. We oppose biomass energy production on any land which relies upon logging activities that are unsustainable, or that jeopardize fully functioning forest ecosystems. We also oppose biomass energy fuel production which interferes with ongoing restoration of ecosystems with native plants and animals, or with the reestablishment or protection of biological corridors to link isolated forest stands.

Sierra Club recognizes the importance of forest products to our society, and supports changes in industry practices that move in the direction of sustainability, to preserve the resource for future generations. For further details on forest concerns, please see the Club's FOREST POLICY.

We are deeply concerned about the implications of wood-to-energy for native forests under severe pressure globally both from logging interests and from agricultural clearing.

III. FUEL FARMING

Fuel farming refers to plants, including trees, which are grown to be used as fuel either as harvested plants or as liquid fuel or gas generated from the plant biomass. Activists are encouraged to consider whether a specific project involves environmentally beneficial or detrimental conversion of land use, allocation of water resources, the composition of any fertilizers or other agricultural chemicals and environmental impacts associated with any application, and the proposed combustion technology.

Generally, smaller, local projects which avoid inefficient transportation of fuel stocks by providing distributed power directly to the end users or at sections of the electric grid remote from power plants are the most advantageous. Fuel farm crops may include switchgrass, woody herbaceous crops, or short rotation woody crops such as willow. (Agricultural waste as fuel is dealt with in the Waste to Energy section, below.)

Our AGRICULTURE POLICY describes agriculture as raising plants and animals for food and fiber. Harvesting forests for fuel has a long history, but raising plants specifically for energy production is a

departure from the historical use of plant fiber to produce food and goods. Still, many of the same concerns apply. The Sierra Club opposes farming practices which supplant wilderness or other natural land, reduce genetic diversity, require greater energy and material input per unit production, increase use of manufactured fertilizers and biocides on existing agricultural lands, or which displace indigenous people or accelerate the conversion of family farms to corporate agribusiness acreage.

Adequate controls are not in place domestically or internationally to prevent the water requirements of fuel farms from taking precedence over use of water for subsistence farming, food and fiber crop farming, fisheries, recreation, drinking and household use. In water-deficient areas, dry land farming techniques are more acceptable than water-intensive agriculture.

The Club's BIOTECHNOLOGY POLICY opposes any release or commercialization of genetically engineered organisms until appropriate procedures are in place to protect human health, biodiversity, and cultural systems and which details appropriate procedures and controls.

Fuel farming presents potential benefits as well as liabilities: The cultivation of the prairie grass switchgrass (*Panicum virgatum*) as a fuel has some promising aspects. Switchgrass is one of the five or so dominant species in the native prairie and, as such, it requires no pesticides after establishment. It has an extensive root system which remains in place perennially so that the soil remains relatively undisturbed and can perform its natural functions such as nutrient retention. Since native tallgrass prairie species evolved in relatively low nitrogen environments, its requirements may be met with manure rather than chemical fertilizer application. The grass can serve as animal cover and should be an important tool for developing wildlife corridors.

Ethanol is considered a biomass-to-energy fuel. Members are referred to the Club's ALTERNATIVE TRANSPORTATION FUELS and GASAHOL (ETHANOL) policies for detailed information. While we support the development and tests of promising alternative transportation fuels and technologies and limited applications where alternative fuels can provide clearly demonstrable and significant environmental benefits, we do not promote the general, nationwide use of any specific transportation fuel. Similarly, we do not endorse any legislation or regulatory action that, by mandated use, subsidy, or preferential relaxation of emission standards, is intended to favor the general, nationwide use of a specific fuel. The Club recommends safeguards to ensure that such production, programs, and policies do not cause adverse environmental impacts on the land, rely on excessive fossil-fuel based fertilizer, or adversely affect the price or supply of food products.

BIOMASS WASTE TO ENERGY

1. Animal Waste
2. Agricultural waste
3. Paper sludge and other industrial wastes
4. Landfill Gas

Sierra Club favors decreasing the amount of waste generated by minimizing the use of materials: reduce, re-use, recycle (in order of importance), whether in obtaining raw materials (e.g. mining, forestry), growing or manufacturing goods or in packaging consumer goods. Reuse and recovery facilities, like other industrial facilities, should not release hazardous substances or noxious odors. Waste combustion, with or without energy recovery, is appropriate only in very narrow circumstances.

Our SOLID WASTE GUIDANCE states that we oppose products or packaging that are unsafe in production, use, post-consumer use, or that produce or release harmful byproducts when disposed of. In the case of agricultural waste, we favor returning harvest stubble to the field where possible. Where

reapplying plant waste to soil is not feasible, the use of waste for composting, construction material, chemicals, consumer products, animal bedding, and other material reuses are preferable to combustion.

1. Animal Waste:

We also favor returning animal waste nutrients to the soil. However, we oppose excessive applications of waste to soil or applications of biomass waste contaminated with industrial, biological or chemical pollutants. Combustion of mixed waste streams is inefficient and invariably produces persistent bioaccumulative toxic emissions.

The Club opposes combustion of municipal wastes, medical wastes, and hazardous wastes for disposal or for energy. We also reject burning such mixed waste for disposal or supposed "energy recovery" in boilers, cement kilns, and other open-ended combustion devices. Similarly, a biomass waste stream which is mixed with hazardous substances (including those which form hazardous substances when burned) or a biomass waste stream which is contaminated with hazardous substances, becomes a hazardous waste stream.

There are countless approaches to using agricultural and other biomass waste substances to produce energy. Here is how some projects that raise agricultural waste and industrial waste issues mesh with the Sierra Club's overall approach to waste minimization and management:

2. Agricultural waste:

Many local biomass proposals target post-harvest stubble. Rather than burning this waste, much of it should be returned to the soil for soil health, tilth, fertility, and nurturing the organisms populating the below ground ecosystem. However, in many cases, farmers continue to burn off the stubble, posing a health threat to nearby residents. We support local efforts to stop open burning either by collecting it for composting or for co-energy production in a boiler outfitted with effective pollution control equipment.

We recommend that local activists insist that stringent pollution control and monitoring be specified in the permitting for such facilities and that the fuel sources for any proposed facility be identified, specified, and limited in the permit.

Chipping trees for chicken bedding, then cofiring the bedding with chicken waste and carcasses is in practice at Concentrated Animal Feeding Operations (CAFOs). The Sierra Club opposes CAFOs as unsustainable, unhealthy for humans and animals, cruel, and environmentally damaging. We do not support burdening communities with boilers incinerating animal waste and carcasses. [In-wood chipping is addressed (above) in the Native Forest section of this Guidance]. The way to eliminate waste management problems accompanying CAFO's is to eliminate them and to return to family farms and other sustainable, community-based agricultural practices.

3. Paper sludge and other industrial wastes:

In cases where industrial waste is to be combusted for energy recovery, the waste burning facility should be regulated as a waste combustor rather than an energy facility in order to exert the greatest regulatory control over the emissions which will result. The Club's POLLUTION POLICY opposes waste combustion which releases persistent bioaccumulative toxic chemicals such as mercury, lead, dioxins, and furans because they are harmful to human life and to the biosphere. The combustion of paper sludge, even with energy recovery, is a way to channel rather than to stem the tide of waste generated by the paper industry. Waste combustion with or without energy production does not promote the systematic changes needed in the paper industry such as ending the unsustainable harvest of natural resources, the failure to reuse and recycle materials, and the failure to adopt less toxic manufacturing

processes.

4. Landfill Gas:

Landfill gas is a dangerous mixture of methane, carbon dioxide and a potent dash of various toxic organic and mercuric pollutants. We view landfill gas as a waste problem and our aim is to find waste management solutions which will fully protect the environment and the public health. We support collection and treatment of landfill gas because methane is a greenhouse pollutant and because the uncollected gasses can produce hazards and health threats to surrounding communities.

Currently the best available treatment technology may be to remove the toxic constituents of the gasses to the degree technically possible and to burn the methane portion of the gas using a combustion device equipped with the best pollution control equipment available. Purification of landfill gas to "pipeline quality" generally meets with our objectives. The quantity of gas available from landfills is an insignificant contribution to our energy resources, and burning it is desirable because methane is at least 20 times more potent as a greenhouse gas than its combustion product (CO₂ and water), whether or not energy is produced.

The landfill operator must remain fully responsible and liable for fully removing the toxic constituents of landfill gasses prior to energy recovery.