

CHAPTER I:

Call to Action

Energy is one of the critical challenges facing Montana, and indeed the nation and planet, in this first decade of the 21st Century.

Energy prices continue to skyrocket. Dependence on foreign oil increasingly dictates our economic and political decisions, while demand continues unabated. Global terrorism, war, and unstable regimes threaten secure and reliable supplies of oil and natural gas. Many experts both in and outside the petroleum industry foresee dramatically increased costs in exploration, development, and recovery in the near future as we approach (and some say already have passed) “Peak Oil”—that point where the amount of oil already extracted equals the amount remaining in the ground.

Exacerbating the problem, there is growing and alarming evidence along with nearly unanimous consensus among climate scientists, that global warming not only is occurring, but is accelerating; its effects are profoundly felt worldwide, and will only get worse unless we substantially reduce our greenhouse gas emissions immediately. Many climatologists suggest that greenhouse gas emissions must be curtailed by at least 80 percent by mid-century to keep atmospheric carbon dioxide (CO₂) levels low enough to prevent catastrophic changes in our climate, our environment, and our lives.

Many proposals have been made on how best to address these challenges as communities and businesses urge government to help orchestrate solutions. Montana’s Governor Brian Schweitzer has committed the state to “secure a long-term, sustainable, reliable and affordable energy future for our citizens and businesses, and to secure economic growth from energy development in targeted areas of the state.”¹ In addition, the Governor mentions Montana’s “obligation to the nation to help secure energy independence” and has committed this state to programs that are sweeping the nation, like the Apollo Alliance² and 25 x ’25³.

MONTANA CAN PROSPER BY
HANDLING ALL IN-STATE ENERGY NEEDS
FOR FUELS AND ELECTRICITY
BY INVESTING FIRST IN ENERGY EFFICIENCY,
THEN IN THE STATE’S ABUNDANT,
CLEAN RENEWABLE SOURCES
—WIND, SUN, BIOFUELS, AND MORE.

1 “Tapping Montana’s Power Potential: The Schweitzer Energy Policy.” Governor’s Office of Economic Development. 2006. <www.business.mt.gov/docs/EnergyPolicy.pdf>.

2 The Apollo Alliance for Good Jobs and Clean Energy. <www.apolloalliance.org>.

3 “25 x ’25: America’s Energy Future.” <www.25x25.org>.

A BLUEPRINT FOR HOMEGROWN ENERGY SELF-RELIANCE

The Apollo Alliance has brought together 35 national and local labor unions with 135 businesses, farms, environmental and other groups in a 10-point plan to make America energy independent with 20 percent of its energy coming from renewable energy by 2020.⁴ The goal of 25 x '25 (a member of the Apollo Alliance) is for farms and ranches to meet 25 percent of U.S. energy needs from renewable resources like wind, solar, and biofuels⁵ by the year 2025 while continuing to produce safe, abundant, and affordable food, feed and fiber.

Proposals like Apollo Alliance and 25 x '25 show us that, as desperate as our situation sounds, opportunities are arising that equal those during the Industrial Revolution. The profound cultural shift and astonishing economic growth of that period was based on **spending our energy capital**—ancient sunlight “banked” in the form of coal, oil and gas.

Today’s shift, no less profound, will move us away from exhausting the last of our energy capital toward **living off our energy income**. We will move away from finite fossil fuels toward energy that comes to us in many forms: sun, wind, flowing water, growing plants, and Earth’s own internal heat. Spending our income wisely we can create an economy based not on uncontrolled growth but on prudent development of the gifts that Nature gives us.

The nation resounds with voices from all walks of life, all parts of the political spectrum, calling for action. So too in Montana. Our state, rich in natural resources (both finite and renewable) and rich in its history of innovative industries and self-reliant people, is well positioned to take advantage of existing technologies and native ingenuity. Careful analyses show that Montana can meet all of its own energy needs cleanly, affordably, and elegantly—and become a model for other states to emulate.

This report, *Repowering Montana: A Blueprint for Homegrown Energy Self-Reliance*, outlines how this can be accomplished.

A PRACTICAL VISION

Montana can prosper with an energy policy based entirely on conservation and clean renewable resources. It is feasible to do this, both technically and financially, without damaging our air, water, land or quality of

⁴ The effects of the proposed Apollo plan investments over a 10-year period include the addition of \$1.35 trillion in Gross Domestic Product and 19,463,949 person-years of employment. (“The Ten-Point Plan for Good Jobs and Energy Independence.” <www.apolloalliance.org/strategy_center/ten_point_plan.cfm>.

⁵ Biofuels are liquid or gaseous fuels derived from processing organic material. They are used as a substitute for fossil-based fuels.

life—and without further loading Earth’s atmosphere with carbon dioxide and other greenhouse gases.

Montanans can maintain and grow our economy through smart, aggressive investments in energy efficiency, and by developing diverse and decentralized renewable energy systems—wind, solar, biofuels, and more. This will:

- create useful and fulfilling work for our citizens,
- broaden local ownership of production and distribution systems,
- reduce our vulnerability to natural or human-caused disasters, and
- enhance the resilience and well-being of our rural and urban communities.

Smart planning requires first describing specific goals, then ascertaining the starting point—current conditions—and finally mapping promising routes to desired future conditions. So where is our starting point?

In 1975, the price that a Montana farmer received for a bushel of wheat and the price of a barrel of oil were about the same, \$3.50. By 2006, with oil ballooning to over \$70 a barrel and wheat still stuck at \$3.50 a bushel, the vulnerability of Montana’s economy to multinational energy companies had become painfully obvious. And in another thirty years how will the price of oil compare with the price of wheat?

Montana oil refineries currently produce more than twice as much gasoline and diesel fuel as is sold at retail in the state. Yet consumers in Montana consistently pay more than the national average for petroleum fuels. Each year nearly \$1.5 billion leaves our economy to pay for these fuels.⁶ By fall of 2005, then again during late summer 2006, Montanans were paying at an even higher rate, as retail prices spiked to \$3 per gallon for gasoline and diesel, both produced by these same refineries. Oil companies told us that we were paying this price for fuel because of a hurricane in the Gulf of Mexico and demand in China.

What about the price of electricity? Montana generates almost twice as much electricity as we consume in the state.⁷ Prior to deregulation in 1997, Montana had the fifth or sixth lowest electrical rates in the nation.⁸

6 “Energize Montana” <www.deq.mt.gov/energy/index.asp>, 2006.

7 “Understanding Energy in Montana: A Guide to Electricity, Natural Gas, Coal, and Petroleum Produced and Consumed in Montana: Summary”—Department of Environmental Quality Report. October 2004. <www.leg.mt.gov/content/publications/lepo/2005_deq_energy_report/summary.pdf>.

8 Deregulation eliminated the protection from competition that a regulated power company—which handled all aspects of electrical generation, distribution and customer service in about two-thirds of the state—enjoyed. Citing open competition as an improvement for rate payers, the company, Montana Power, divided generation from distribution and customer service, then sold these separate functions to two out-of-state corporations.

After deregulation, when Montana entered the so-called “free market” for power, the supply rate doubled. Meanwhile, the new owner of most of our state’s private dams and power plants, Pennsylvania Power and Light (PPL-Montana), was an unregulated utility, “freed” to sell low-production-cost Montana electricity to out of state markets, primarily on the West Coast, at much higher West Coast prices. Now, even though our state produces excess power, Montanans face paying for the construction of expensive new generating capacity to replace low-cost electricity that formerly came from the state’s hydroelectric dams and paid-off older coal-fired power plants. Electricity from any new coal-fired power plants will end up costing three to five times more than electricity from dams long since paid for by Montana ratepayers. (This is based on an approximate price of 2 cents per kilowatt hour (kWh) for hydro-power and a range of 6 to 10 cents per kWh for power from new coal.)

Deregulation was devastating because it allowed Montana Power Company (MPC) to divest itself of generating and transmission infrastructure, which Montanans had already largely paid for. Once utility property is paid for and depreciated, it should no longer be part of the rate structure, and the price of power should go down. However, when MPC’s dams and power plants were sold to PPL-Montana, people buying power generated by these new owners have ended up paying again—for the same dams and power plants. Low power rates, a competitive advantage once enjoyed by Montana businesses, have vanished. Public ownership or at least a revival of effective regulation could break this cycle.

The now-regionalized market for electricity and the global market for fossil fuels—replete with erratic price spikes and plunges—operate far beyond Montana’s control, yet they dominate our economy. Access to our abundant energy supplies becomes uncertain; energy prices become unpredictable. Federal energy policies and often-ineffective state regulation offer citizens of states like Montana little or no protection. This is one reason that in October 2005 Governor Brian Schweitzer convened a Montana Energy Symposium at Montana State University in Bozeman. Expressing dissatisfaction with federal energy policy, the Governor challenged Montanans to think big about energy, to come up with Big Ideas.

HERE’S A BIG IDEA: THINK SMALL.

AERO acknowledges the need to see our world wholly and comprehensively, and to understand our connections with all things human and natural, but the authors of this *Blueprint* believe our focus must be on what we can accomplish right here, where we live. A host of diverse, decentralized, appropriately scaled technologies can achieve those “Big” ends. In contrast to the

global energy economy, an economy emphasizing energy efficiency and local ownership and production of fuels and electricity can ensure reliable supplies at predictable costs; can help revitalize Montana agriculture and manufacturing; can reverse the decline of rural and urban communities around our state; and where communities are thriving, can help ensure their continuing vitality.

A sound Montana energy policy will remove legal and regulatory barriers to implementing energy efficiency and renewable energy. Furthermore, a sound Montana energy policy will create incentives to support such alternatives. Today there are many mechanisms, both public and private, to finance large, centralized energy generation and distribution systems. Most financial institutions are comfortable writing large checks to a few borrowers instead

of writing many checks to a variety of smaller clients. Yet if one or two of those large borrowers fail to repay their loans, what then? We need financing mechanisms that acknowledge the value of diverse enterprises—large, medium and small. A farm can flourish by growing a variety of crops to sell; a bank can flourish by supporting a variety of localized conservation and renewable energy systems.

Today, a localized approach is the most effective means to achieve swift and equitable economic development. Conventional scenarios of extracting non-renewable resources and shipping them out of state—or, in the case of coal, burning it here and polluting our air, water and soil in order to spin off electrons to transmit elsewhere—are not sustainable practices over the long term. Additionally, technology has developed to the point that even high outputs of energy generate very few jobs. And centralized facilities distribute those limited jobs very unevenly.

We Montanans recognize our obligation to contribute to the energy needs of this nation, but these must be true needs, not driven by insatiable appetites, by exploitation and waste. Montana’s best contribution to the nation, and to the planet at large, will be to move beyond our historic role as a mineral and energy colony, shipping our wealth and profits elsewhere. We can forge a new role. Montana can stand as a regional model of clean energy, local self-reliance and “homeland security” by identifying and meeting our own true needs first, then sharing our excess with our neighbors.

The key to this new role is conserving energy. Moving decisively, Montanans can eliminate excess consumption and needless waste of our resources, investing first in simple low-cost efficiencies and later by encouraging elegant, comprehensive design. Moving carefully but steadily, Montanans can develop our state’s clean renewable resources with an eye to eventually supplying all—

LOCALIZING ENERGY TRANSACTIONS
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100 percent—of our state’s internal energy requirements. Such a transition has its challenges, but much of the infrastructure and most, if not all, of the technologies are here now to accomplish it.

Let us be clear. Montana wind, sun, hydropower and biofuels will not soon (if ever) replace Montana’s coal in supplying export markets at current or expanded levels. This *Blueprint* is NOT suggesting that Montana should suddenly stop mining its low-sulfur sub-bituminous coal, three-fourths of which currently is shipped to power plants out of state, with the remainder burned in existing power plants in state (about half of this coal-fired electricity flows out of state). This is an entrenched export economy that will not soon pass.

However, this *Blueprint* makes the case that investing in new coal-fired generating plants, or in producing synthetic fuels from coal, is both unnecessary and uneconomical: too costly in money and too costly for our air, water, land, and ultimately our local communities. This will become clear once Montana sets out seriously to conserve energy and, with efficiency and grace, tune into our abundant, clean, renewable energy sources. AERO offers *Repowering Montana: A Blueprint for Homegrown Energy Self-Reliance* as a catalyst for citizen participation and as a template for Montana’s public and private sectors to create this sound statewide energy policy.

AERO’S TEST CRITERIA FOR ENERGY RESOURCES

1. Is the resource sustainable and renewable?
2. Does its development emphasize conservation and efficiency?
3. Does it originate from current solar energy (direct or embodied in living plants) or wind or other regenerative energy?
4. Does it avoid polluting our air, water, soil, bodies and views?
5. Does it avoid producing greenhouse gases that exacerbate global warming?
6. Is it produced close to the end-user?
7. Is it scaled to allow wide participation in its production and distribution?
8. How much of it is financed, owned and/or operated by Montanans?
9. Is it priced accessibly for all Montanans?

CONTRASTING ENERGY ASSUMPTIONS

Underlying any policy or program are assumptions that often are unstated or unquestioned. Here are some assumptions underlying conventional energy scenarios in Montana—Business As Usual—compared with AERO’s Energy Assumptions.

BUSINESS AS USUAL	AERO’S ENERGY ASSUMPTIONS
<ul style="list-style-type: none"> Continuing growth in energy use, in Montana and the U.S., is inevitable, desirable and sustainable. (Carbon pollution of the atmosphere, furthering global warming, is not addressed or is addressed only minimally.) 	<ul style="list-style-type: none"> Continuous growth in energy use is neither inevitable nor desirable, and certainly not sustainable.
<ul style="list-style-type: none"> Montana has both the capacity and obligation to help supply, with no defined ceiling, this upward trend in energy consumption. 	<ul style="list-style-type: none"> Montanans may continue to export surplus energy, prompted by the market, but should not encourage wasteful consumption of either non-renewable or renewable energy resources, in or out of state, by constantly increasing supply.
<ul style="list-style-type: none"> Doing so will benefit the Montana economy, reduce dependence on foreign oil, add to national security, and will not harm the environment or society. 	<ul style="list-style-type: none"> It is in Montana’s best economic interest to control, as much as possible, production, distribution, management and financing of our energy resources, with an eye to serving Montana needs first.
<ul style="list-style-type: none"> Coal can and should be a major on-going part of this scenario. A viable market will exist for fossil fuel energy—especially coal-generated electricity—for the foreseeable future. Carbon dioxide levels will be controlled by various “sequestration” techniques, many as of yet unproven in Montana. 	<ul style="list-style-type: none"> Coal should be gradually phased out as a primary energy source, both within Montana and to supply Montana’s export markets.
<ul style="list-style-type: none"> Leave the solutions to “experts” already in the energy business. 	<ul style="list-style-type: none"> Citizens must play a central, participatory role in shaping Montana’s energy future.

AERO's Energy Assumptions are based on a critical analysis of current and likely future economic and environmental conditions; on the geopolitical energy landscape; on global population and development trends; and on the precautionary principle—that is, taking only those actions that are proven to be beneficial or that (at worst) do no harm. The rationale behind these assumptions above can be summarized in five points.

1. **Cost-effective investments in energy efficiency** can stabilize and eventually reduce overall energy consumption. However, in both the short and the long term, we need to ensure that gains in efficiency do not spur heedless increases in energy consumption.
2. **Smaller, decentralized production facilities** keep dollars circulating in local communities and thus are favored. The financing needs of larger, centralized production facilities guarantee that the bulk of investment dollars will flow in from outside the state, with the bulk of profits flowing back out, subverting the influence and economic stability of Montana communities.
3. **An orderly transition to a clean, renewable, sustainable energy economy** ultimately will be less expensive for Montana consumers and will create new jobs. Government at all levels should act to minimize transition costs and create incentives for job opportunities in the new economy, in the same sectors where workers have lost jobs with the passing of the old economy.
4. **The transition to conservation and renewables will occur over a number of years**, as people come to understand its advantages, including the realization that the “highest and best” use of Montana coal is not to be extracted for a one-time burn, gasification, or liquefaction, but rather to remain where it is, in the ground. Coal is the primary aquifer for much of eastern Montana, and as an intact aquifer it helps assure the continued integrity of springs, wells and streams, the lifeblood of this semi-arid region.
5. **Citizen participation can and must occur** through a variety of methods, including open public forums. Decision-makers must be held accountable to the public through measurable results in energy conservation, sustainable energy production, and localized economic flows.

THE PATH AHEAD

Montana stands at a crossroads. Intelligent, informed decisions made now can lead to a relatively stable, locally grown energy economy and a healthy environment for us, our grandchildren, and our grandchildren's grandchildren—or we default to continued dependence on fossil fuels, foreign imports, and an ever more degraded environment.

Understanding the need for action, in September 2006, Governor Schweitzer released his proposed Energy Policy, titled “*Tapping Montana’s Power Potential*”.⁹ This policy promotes eight specific points:

1. Diversified Energy Development including “the nation’s largest reserves of coal” and “abundant oil, natural gas, and coal bed methane opportunities.”
2. Renewable Energy Development including wind generation, hydro, ethanol, biodiesel, biomass, and other renewable forms of energy.
3. Cleaner Energy Development that is market-driven and socially responsible. “State government will focus substantial efforts and resources on promoting energy development projects that meet the rising demand for cleaner energy.”
4. Development with Clean Coal Technologies: “The state will focus energy development of coal, including state-owned coal, on coal-to-liquids plants, IGCC electrical power plants,¹⁰ and other clean coal technologies.”
5. Value-adding Energy Development: “The state will commit itself to adopting policies and practices that emphasize more value-adding in the energy field, whether the initial source is bio-based or carbon-based.”
6. Energy Efficiency and Conservation: “State government will focus resources on energy efficiency and conservation, through both direct assistance to Montana’s lower income families and support of industries, businesses, and practices to promote energy efficiency.”
7. Adherence to Environmental Laws and Community Acceptance: “The use of public resources to promote new energy projects will follow a high standard, concentrating on the cleanest projects proposed by industry and those that find community acceptance.”
8. Supportive of Infrastructure Development: “We will commit the state ef-

⁹ “Tapping Montana’s Power Potential: The Schweitzer Energy Policy.” Governor’s Office of Economic Development. 2006. <www.business.mt.gov/docs/EnergyPolicy.pdf>.

¹⁰ Integrated Gasification Combined Cycle (IGCC) is a method of converting coal to gas to be burned to produce electricity. It captures many polluting gases such as sulfur dioxide (SO₂) and nitrous oxides (NO_x) which are common by-products of burning coal. It does not reduce carbon dioxide emissions.

forts to strengthening our energy delivery links internally and to the rest of the world.”

The above policy is augmented by a large collection of data and statistics which are maintained by the Montana Department of Environmental Quality (DEQ).¹¹ Although there are a number of programs and incentives available, unfortunately much of this information is not widely distributed or promoted.

Analyzing which of the above eight items on the Governor’s list are most readily do-able—economically, socially and technically—and combining those options with others that have been successfully implemented in other regions, there appear to be three broad paths from which Montanans can launch an energy policy: Business as Usual; Supply Side Strategy; or, Demand Side Management.

Only one energy path appears to be truly sustainable.

The assumptions of the first path—**Business as Usual**—have been set forth previously. It is the default position. It assumes, indeed requires, continued growth in the economy based on continuing resource extraction and a continuing rise in energy consumption, primarily of fossil fuels. Under Business as Usual, Montanans can expect continuing price increases for transportation fuels, home heating, electricity, food and other necessities, and increasing vulnerability to interruptions in supply. Weather and geo-political instability – two elements beyond our control – will largely dictate how severely we are affected. Business as Usual seems like a dead end.

The second path, emphasizing the **Supply Side**, includes a mix of fossil fuels and “clean” energy sources. One plan, titled *Montana Vision 2020: Montana’s Portfolio for the Future*, was developed in 2003 in response to the Montana Legislature’s House Resolution No. 26. It resolved “to take all possible steps to move Montana into a hydrogen-based economy.” *Montana Vision 2020* appeared as Appendix B of “Hydrogen, Wind, Biodiesel, and Ethanol: Alternative Energy Sources to Fuel Montana’s Future,” a document published in 2004 by the Montana Department of Environmental Quality. Since then it has been difficult to discern what, if any, “possible steps” have been taken toward a hydrogen economy. This plan appears to favor maximizing energy production, with few targets to stabilize or reduce overall energy production and consumption.

Governor Schweitzer’s energy policy as outlined in “***Tapping Montana’s Power Potential***” is biased toward the **Supply Side**. Although energy

¹¹ See “Energize Montana” at <deq.mt.gov/energy/index.asp> that summarizes current energy statistics and programs, including conservation, commercial and home building codes, alternative energy loans, net metering, biofuels, wind and solar/geothermal programs.

efficiency and conservation are listed in the Governor’s policy, they are not its foundation. The foundation appears closer to something that speakers at the October 2005 Energy Symposium, including the Governor, referred to as TED—Total Energy Development:

- Develop improved “clean coal” technologies that can add electricity to the grid while liquefying coal to feed the nation’s demand for fuel;
- Develop alternative energy technologies to serve local communities and provide additional electricity for export over the grid;
- Increase transmission capacity for electricity and transportation infrastructure for fuels (including coal-derived synthetic fuels) as well as for the water required to produce these fuels and for the potentially distant “sequestering” of carbon produced during the process;
- Do all this in an environmentally acceptable way.

The coal portion of this plan is premised on the unproven theory that through the efforts of industry, academia, advocacy groups, and government agencies, Montana can develop methods to make coal environmentally safe for this state and, through sequestering carbon, safe for the world. Governor Schweitzer has said he wants Montana to pioneer this so-called “clean coal” technology; wisely, he also has indicated that if this cannot be done cleanly and cost-effectively—without exacerbating global warming—coal should not be further developed at all.

Financing this “clean coal” initiative would require a mix of private and public sources willing to invest billions of dollars to design, develop and implement workable technologies and significant upgrades and expansions of multiple aspects of energy infrastructure—pipelines, power lines, railroads, sites for sequestering carbon, etc. The primary participants would be major corporations and, almost certainly, the federal government. This effort does not seem to include significant roles for small business, local entrepreneurs or those lacking major venture capital. Likewise, economic “boom” development would be, geographically, highly centralized. Failure to accomplish the “clean coal” goal would not only cost investors but also negate desired benefits—jobs, property tax income, etc.—and leave a massive bill on the doorsteps of all Montanans.

The third path, **Demand-Side Management**, is based on the recognition that endless growth in energy production and consumption is neither possible nor desirable, so that the first step is making significant investments in conservation and efficiency. Beyond this, the goal is to develop only environmentally friendly forms of energy—something Montana is uniquely suited to do. This *Blueprint* demonstrates that all fuels and all electricity consumed in Montana can be produced in Montana without degrading our environment or

economy. And finally, this *Blueprint* recommends that any excess energy available for export (in whatever form: electricity, fuels, food, building materials, etc.) meet AERO's Test Criteria outlined earlier, particularly no damage to our soil, water, air or quality of life, and keeping the bulk of the profits in our communities and in our state.

This third path promotes progress on multiple fronts, allowing broad participation from people and institutions at many economic levels. Corporations, small businesses, private entrepreneurs and community-financed systems are all encouraged to participate. A multi-pronged approach invites localized solutions tailored to local needs and allows investments of all sizes to be made incrementally. Even setbacks can contribute to success; learning from occasional failures can help in achieving overall goals.

Following this third path, Montana can become an inspiration for other states as we:

- Foster more Montana jobs over the long term,
- Spend less, both short- and long-term,
- Create long-term stability in Montana's energy markets,
- Create more security from disruption from natural disasters (earthquakes, storms, etc.) and man-made disruptions (terrorism, operator error, Enron-like market manipulations, etc.),
- Reduce pollution and emissions of greenhouse gases,
- Promote healthier rural and urban communities,
- Renew Montana as a place of economic opportunity and cultural richness, and preserve her natural beauty.