



# Montana's Agenda

ISSUES SHAPING OUR STATE

## Some Synfuel Thoughts



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*Governor of Montana*

**A**merica needs to come to terms with a basic fact: We don't need oil to make the fuels we depend on. Reasons abound why we should get serious about the potential of converting other carbon-based substances — crops, waste, manure, and coal, for example — into combustible fuels. The earth's oil reserves will be depleted one day and, before that time, the environmental and national security costs of continued reliance on oil will become greater than our country can bear.

Small projects sprouting up around the nation can be a catalyst for our energy future. In Montana, the legislature has enacted incentives for the production of alternative fuels such as ethanol and biodiesel. My office has taken steps during the last six months to get further into the synfuel game. I have been actively working with the private sector to facilitate construction of a synthetic fuel plant in eastern Montana (the exact location is yet to be determined). The idea is to capitalize on the state's phenomenal coal supply, create jobs, and provide Montana and the nation with an alternative fuel. These are good steps, but Washington must take the lead.

## The Case for Synfuel

Synfuel projects are vital to the nation for several reasons. While only one of many alternatives to oil-based fuel, synfuel offers the promise of being produced on American soil by American workers. Energy independence will protect both our citizens and our men and women in uniform. The Department of Defense, the largest single consumer of foreign oil in the country, is keenly interested in new options. Last year the department, desperate for a secure, domestic fuel source, proposed buying every drop of battlefield-tested synfuel that America could produce. The increasingly untenable alternative is relying on Middle Eastern totalitarian regimes with possible ties to terrorists.

Besides energy independence, another attractive feature of synfuel is its environmental compatibility. While turning solid coal into liquid fuel is complex and expensive, its expected environmental payoff is so significant that major environmental groups which have traditionally opposed coal development are now showing interest. Why? Synthetic automotive fuels burn significantly cleaner than their conventional counterparts. Carbon monoxide is reduced by half, and sulfur is almost nonexistent.

## Synfuel Technology

Although it sounds like alchemy, the technology for converting coal into synthetic gasoline, diesel, and aviation fuel has been around for almost a century. In 1913, a German scientist named Friedrich Bergius perfected a method of using hydrogenation to turn solid coal into crude diesel

fuel. In the 1940s, when allied forces invaded Germany, a form of synfuel was being used to power more than 90 percent of Nazi tanks and planes. In the 1950s, South Africa used the Fischer-Tropsch process, an updated version of the Bergius method, to change coal to synthetic natural gas and distill the gas into liquid fuel. Fischer-Tropsch remains the principal coal-to-fuel technology. South Africa uses it to produce 150,000 barrels of gasoline and 50,000 barrels of diesel fuel each day without a drop of oil – the only mass production of liquid-coal fuels in the world today. Facing the uncertain world oil market, China and India have begun to invest seriously in synthetic fuel production, and Qatar, a nation rich in natural gas, is currently constructing a giant gas-to-liquids facility.

How does Fischer-Tropsch work? First coal is crushed and loaded into a gasification unit, where the coal is turned into gas not by combustion but by a contained chemical reaction using a catalyst such as iron or cobalt. The resulting synthetic natural gas can be sold on the natural gas market, used to create electric power, or synthesized into liquid fuel.

This gasification process differs greatly from the combustion process at coal-fired power plants. Oxidation takes place in a closed unit where byproducts are captured, avoiding the atmospheric emission of sulfur, mercury, and arsenic that comes with pulverization of coal. These impurities can be captured and sold off. Even greenhouse gases can be contained. In Beulah, North Dakota, a coal gasification plant pipes carbon dioxide to Saskatchewan where the gas is injected into oil fields to loosen up hard-to-extract petroleum, and the CO<sub>2</sub> remains stored underground.

Besides conversion to hydrogen for fuel cells or to synthetic petroleum fuels, “syngas” can be used to

generate electric power. When electricity is the end product, environmental gains are significant. Coal-fueled power plants (which generate half of this country's electricity) produce an abundance of mercury, carbon dioxide, sulfur, and oxides of nitrogen. These bad byproducts, however, can be drastically reduced in the coal-to-liquids-to-electricity process: nitrogen oxide by more than 90 percent and sulfur by more than 99 percent.

## Obstacles

To push ahead, America must forget its false starts and past failures. In the 1920s, the U.S. Bureau of Mines began to make synfuel and study its large-scale production. In the 1940s, the synfuel future appeared brighter with passage of the Synthetic Liquid Fuels Act and appropriation of almost \$80 million for research and development. By 1953, a Missouri test plant was churning out several thousand barrels per day of synthetic unleaded gasoline. But when cheap oil became available from the Middle East, oil companies persuaded the federal government to abandon the research. During the oil crisis of the 1970s, the Carter administration flirted briefly with synfuel but lost interest when the price of oil dropped.

Another obstacle is the cost of labor- and capital-intensive synfuel plants. Estimates are that an 80,000-barrel-per-day plant would take upwards of \$6 billion to build. The cost of producing each barrel of finished product would be about \$35. Only significant investment by the federal government — like the subsidies and tax breaks that have gone to the oil industry — can bring down the cost of production.

## Doing Better This Time

Despite these barriers, the stars could be coming into alignment for synfuel. Oil diplomacy has given Americans pause. The military has become a player because of its immediate needs. Energy woes have spurred private investment. Congress recently put incentives for coal-to-liquid production in its Energy Bill. But we need to do far more now. Our nation put an astronaut on the moon 66 years after the Wright Brothers' flight. More time than that has elapsed since science first wrung fuel out of coal, corn, and soybeans. The federal government and the states have set the ball rolling — again. This time the momentum cannot be lost.

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