EmeraldCarbon – Making clean coal work

a synergy to massively mitigate power plant and vehicle emissions

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For the capture and economic recycling of power-plant CO_2 emissions and coal-ash for value-added conversion to marketable products by routine process and manufacture. It involves the formation of new industrial cooperatives (NICs) for economic fulfillment of local communities and client nations.

This is a presentation on the EmeraldCarbon initiative
by SET Foundation (SETF), the project originator.
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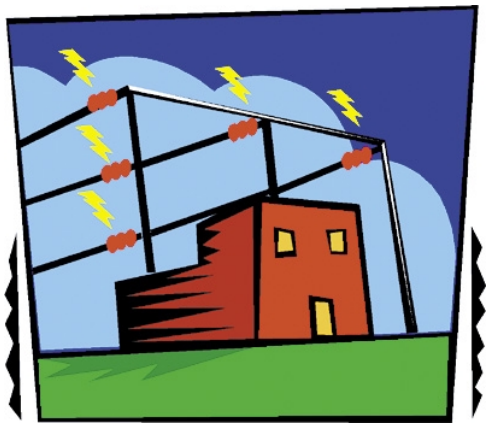
CO_2 Capture & Recycling for Industrial Operations & Coal-/Gas-Fired Power Plants

EmeraldCarbon can process captured CO_2 from retrofitted industrial operations and the nation's coal-/gas-fired power utilities.

1. Host nation industrial operations that emit CO/CO_2 must be retrofitted for efficient carbon-capture;
2. Coal-/gas-power plants across the nation that emit CO_2 must also be retrofitted for carbon-capture and recycling;
3. EmeraldCarbon recyclers will receive CO_2 from sources by pipeline; and,
4. The EmeraldCarbon recyclers will be optimally situated to minimize total pipeline transmission mileage.



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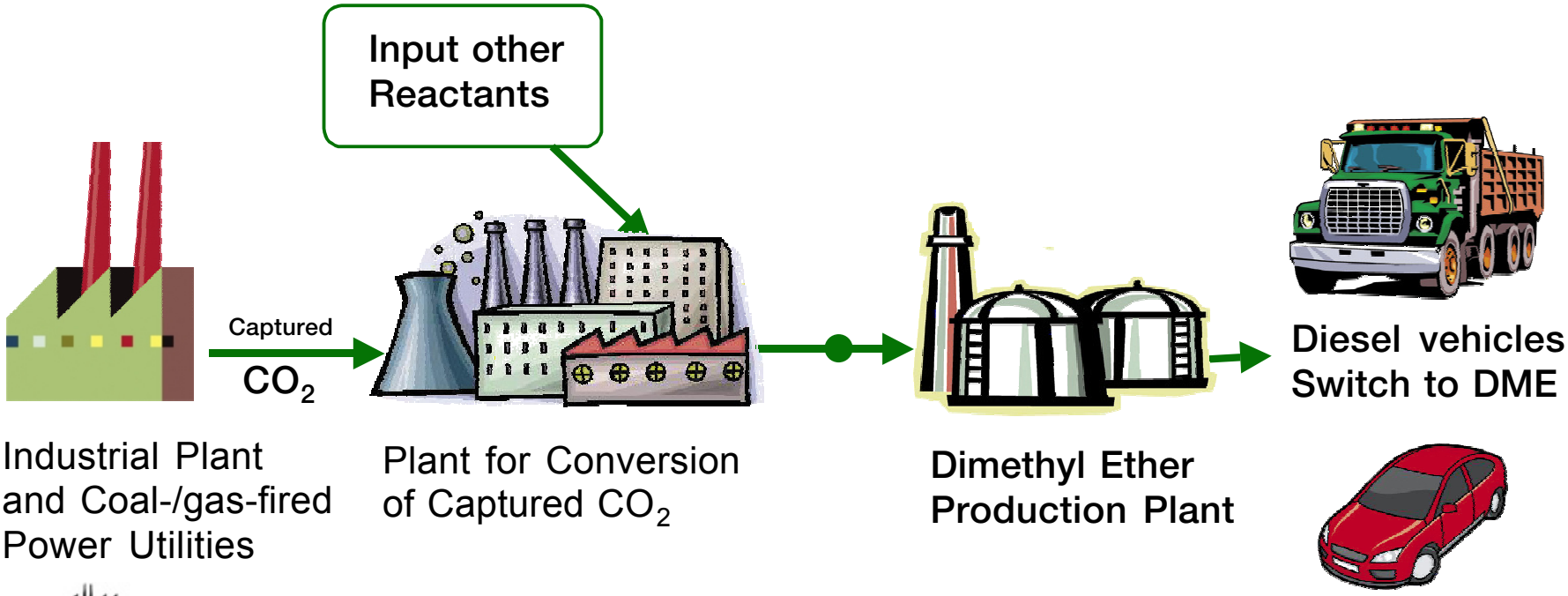
Converting Industrial & Utilities' CO_2 emissions to ultra-clean DME fuel

EmeraldCarbon takes away captured CO_2 emissions from industrial operations and power plants, converting a portion to millions of tons of ***clean dimethyl ether (DME) fuel****. DME replaces polluting diesel in vehicles to reduce roadway & railway emissions while creating local green-collar jobs.*



Why is DME better than diesel? Advantages EmeraldCarbon has over other wasteful methods

For many decades, dimethyl ether (DME) has had numerous uses in industry. Due to high oxygen and lower carbon content in the DME molecule – relative to diesel – soot (particulate emissions) is all but eliminated and CO_2 emission is minimized when diesel is replaced by DME fuel. DME reduction of soot emissions will improve quality of life and productivity across the host nation.

- DME use prevents the formation of unhealthy soot (particulate emissions);
- Lower DME molecular carbon greatly reduces the fuel's CO_2 emissions;
- Others make DME from coal then release CO_2 into the atmosphere, thus losing added-value and green jobs tied to economic recycling of CO_2;
- CO_2 emissions captured and recycled from industry & power utilities produce millions of tons of the cheaper DME; and,
- By our linking DME to the mitigation of industry and utilities' emissions, greater efficiency and added-value are achieved over the other method.

New green-collar jobs in manufacturing & construction

Each EmeraldCarbon recycler generates jobs across three plant types: 1) carbon fiber production; 2) cleansed flyash cement & aggregate prep; and 3) precast module and cross-tie manufacture; and more in durable building construction.

- Generates green-collar production jobs in EmeraldCarbon's plants for carbon fiber production, with technology training;
- Gives added jobs in cleansed flyash cement & aggregate preparation;
- More jobs in precast concrete module & RR cross-tie production; and,
- Increases construction jobs in durable modular building assembly throughout the region.

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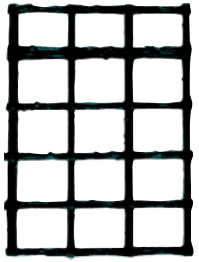
New construction materials from power plant recyclables to housing modules and RR cross-ties

SETF's large-scale carbon conversion of CO_2 supports production of cheap carbon-fiber (CF) to reinforce cleansed flyash concrete building modules and concrete railroad cross-ties – for expanded high-speed RR passenger service. The CF-reinforced flyash precast is 7-times stronger than steel-reinforced precast.

1. EmeraldCarbon plants intake and dissociate CO_2, preparing it as input to CF manufacture process;
2. Makes lower-cost CF using the intermediate carbon and precursors, then fabricating a range of CF-grids;
3. Uses CF-grid product lines to reinforce cleansed flyash concrete precast modules; &
4. Creates CF precast for concrete RR cross-ties to be used regionally.



Carbon-fiber grid

Precast concrete house assembly

Precast tilt-up module

Benefits of cheap EmeraldCarbon precast concrete panels and RR cross-ties from recycled materials

SETF's new carbon-fiber reinforced cleansed flyash concrete for building panels and railroad cross-ties offers special benefits and performance enhancements for building designs when compared with traditional steel-reinforced precast concrete panels.

1. Carbon-fiber (CF) reinforced precast panels & cross-ties are ***7-fold stronger***;
2. EmeraldCarbon CF-cleansed flyash concrete reduces panel wt. by 66%;
3. EmeraldCarbon CF reduces panel thickness by 33%;
4. EmeraldCarbon CF is ***corrosion-resistant*** since carbon fibers don't rust as does steel welded-mesh/rebar;
5. Structures made of CF-precast panels will be of greater longevity; and,
6. Since EmeraldCarbon plants will be located near power plants or clusters of plants, the transport cost of CO_2 & cleansed flyash to the recyclers will be minimized.

Cleansed Flyash Safety & Benefits

Better than ASTM approved flyash cement in structural concrete, EmeraldCarbon cleansed flyash eliminates heavy metal and nuclide traces. The expanded use of our cleansed flyash can cut Portland Cement imports, reducing construction costs.*

1. U.S. EPA investigated, approved and promotes the use of flyash concrete in federally-funded construction projects;
2. Cleansed flyash is inert and safe when bound in concrete;
3. For 50 years flyash concrete has been safely used in both residential and commercial buildings, e.g. Sears Tower; and,
4. Cleansed flyash cement is cheaper/greener than Portland Cement in that processing cost is far less and emissions of CO_2 is much lower.

* American Society for Testing and Materials (f.1898). ASTM standards used globally and in U.S. at all levels of government.