

**A proposal to use Kansas resources to create Kansas jobs
by adding intrastate higher value processing by manufacturing end user products
for use in Kansas.**

Narrative: The state of Kansas is fortunate in that it produces large volumes of commodity items of considerable value such as grain and natural gas. The problem is that these commodities are sold as bulk commodities with minimal instate value added processing which generates jobs, processing and manufacturing infrastructure and tax base. The recent increase in shale gas production is a case in point. In almost all cases the gas is shipped out of state, and in many cases re-imported as finished products such as items made of polyethylene at much higher prices. *What is suggested is a program to use the state's commodity products as feed stock for higher value added processing and manufacturing, located in Kansas, under the control of Kansas state chartered and domiciled corporations, which pay the bulk of their taxes and fees in Kansas.* As a part of this overall strategy, it is suggested, to the extent practicable, the shale gas produced in Kansas be used as feedstock for the production of synthetic petroleum, or more precisely the direct production of ultra low sulfur and ultra low wax distillate fuel such as diesel and JP4 (jet fuel), which commands a premium market price. Of course, the high purity synthetic petroleum produced can be used as premium feedstock for Kansas petrochemical plants, in addition to direct [instate] consumption as distillate fuels.

BASIC ORGANIZATIONAL STRUCTURE:

It is strongly suggested this project be organized as a standard limited liability joint stock corporation chartered by and domiciled in the State of Kansas, with 100% of the single class of issued common stock owned by the State of Kansas, with no preferred shares. While any name may be chosen, *this developmental and demonstration corporation* is referred to in this document as SGTDL [Shale Gas to Distillate Fuel] of Kansas, Inc.

Several reasons exist for suggesting a standard limited liability stock company as the basic organizational structure. These include:

1 Rules of corporate governance can be adopted at the time of chartering [in Kansas] including but not limited to:

- 1.1 Compensation caps on all corporate officers, directors, and other employees with the CEO's compensation to be no higher than the compensation of the president of the United States, and all other officers and directors compensation to be scaled from this amount, *with no bonuses, stock options, retirement plans or deferred compensation programs, not offered to all SGTDF employees.*

- 1.2 Directors and officers compensation to be set as a multiple of the corporate median annual compensation, subject to the limitations of (1.1) above.
 - 1.3 Officers and directors limited to a total of eight years service as an officer and/or director, although they may be retained as a corporate employee.
 - 1.4 Limitation of voting rights to 100 shares of stock per titular or beneficial owner, as soon as the total number of shareholders exceeds 500.
 - 1.5 Policies can be adopted institutionalizing local, or at least instate, hiring and procurement preference policies.
 - 1.6 Policies can be adopted requiring the use of only Kansas domiciled and chartered banks, which are fully subject to Kansas law and oversight, for all SGTDF financial transactions.
 - 1.7 A provision that the last share of common stock, owned by the state is a so-called “golden share,” with veto power over corporate bylaw changes, acquisitions, mergers, or corporate relocation, with the condition that if/when this “golden share” is sold, it reverts to the status of all other common shares with no special veto power.
 - 1.8 A large amount of treasury or shelf stock can be authorized when the corporation is chartered, to be exchanged for additional state assets such as shale gas mineral rights under public lands or acquired from adjacent private owners through eminent domain as required.
 - 1.9 Additional backers such as site preparation contractors, well drilling contractors, fracking contractors, area economic development agencies, end users such as petrochemical plants and large fuel users such as trucking companies and airlines may be willing to contribute cash or “in kind” for access to the demonstration data and/or shares of stock.
 - 1.10 Given the much lower dollar cost and ecological impact for rail as compared to road transport, construction of a rail spur to the drilling site should be considered, and if practicable, the railroad companies may also wish to become SGTDF sponsors.
- 2 **A standard limited liability corporate legal structure and private ownership**, albeit with 100% of the issued shares owned by the state to start, with significant unissued “treasury” stock, results in:
- 2.1 The corporate assets remaining on the tax rolls

- 2.2 Employees of the corporation *not* being covered by civil service regulations/pensions, but rather standard employee law, allowing increased flexibility in hiring, retention and promotion
 - 2.3 “Ownership” being represented by a large number of shares at reasonable per share valuation, will allow easy “phased” privatization over a period of time, with the stock being sold only into an up market, maximizing the state's [tax payers'] and other sponsors' return and avoiding stock sales at fire sale prices
 - 2.4 Financing can be obtained by the corporation through normal commercial channels, using its assets as collateral, avoiding increasing state debt obligations and affecting the state's bond rating. To the extent practicable, capital should be directly raised from small individual investors using small denomination notes. In the internet age this is known as “crowdfunding”¹, and concentrated obligations to one or a few large lenders should be avoided.
 - 2.5 The corporation remains subject to the same laws as and regulations as any other private corporation such as health/safety, environmental, and employment.
- 3 **The state's contribution to the corporation to justify and rationalize the initial ownership of 100% of the *issued* stock is the shale gas mineral rights on selected sections of public land.**
- 3.1 Depending on the circumstances, the state may exercise its right of eminent domain, for adjacent shale gas mineral rights, especially where these are inactive. Under the precedent of *Kelo v City of New London (Conn)*² these shale gas mineral rights may be assigned to the SGTDF corporation in exchange for additional shares of stock.
 - 3.2 The intent of this provision is to maximize total shale gas recovery through proper and prudent management of the gas field, assuring the high value added processing of Kansas resources is done in Kansas, meeting of Kansas distillate fuel needs first, e.g. agricultural production and transport, and the prevention of hoarding or price gouging by restriction of exploration/development/production by less reputable natural resource companies, e.g. Enron³ and Dynegy⁴

1 http://en.wikipedia.org/wiki/Crowd_funding
http://en.wikipedia.org/wiki/Jumpstart_Our_Business_Startups_Act

2 http://en.wikipedia.org/wiki/Kelo_v_City_of_New_London

3 http://en.wikipedia.org/wiki/Enron_Energy_Services

4 <http://en.wikipedia.org/wiki/Dynegy>

4 As the basic reason for the creation of the SGTDF corporation is a development and demonstration project, it is strongly urged that no “partnering” should occur, although the contributions “in kind,” or in cash in return for stock should be encouraged . This is specifically intended to isolate the costs of various operations without vague “overhead” or G&A [General and Administrative] charges to provide the state with a baseline for claimed expenses for later commercial shale gas to distillate fuel facility development and operation. ***The SGTDF corporation should be its own general contractor.***

5 The economics of the SGTDF program are projected as follows:

5.1 It is estimated that it requires about 5 million⁵ \$US to directional drill and hydraulic “frack” a shale gas/oil well. Drilling time averages 25 to 30 days, and fracking requires about 5 days. If the wells are “clustered” the price and time required may be reduced as site preparation, transportation costs and setup time is minimized. *An inverted “tree” configuration will also minimize the cost to transport the gas.* If a drilling contractor can be assured of a relatively long drilling assignment, the price per well may also be reduced.

5.2 A small size unit^{6, 7} for direct conversion of shale/natural gas to premium diesel/jp4 is estimated to cost about 50,000\$US per bbl per day capacity or 50-75 million \$US, last about 20 years and can produce about 1,000-1,500 bbls of liquid per day. If higher production is desired, multiple converters can be installed, giving some redundancy to the conversion operation, allow evaluation of different conversion processes, and allowing easy relocation of the converters (compared to standard size converters and if designed to be rail transportable) if/as required.

A quick review of several types of GTL conversion units does not seem to indicate the use of exotic, expensive or difficult to fabricate materials, e.g. inconel⁸, monel⁹ or titanium¹⁰, nor does the size/complexity of the unit appear to justify such high costs.

The apparent high price may be due to limited and operationally custom or bespoke construction of each unit. Productization/standardization for volume production, and substitution of custom systems (for example control systems using personal computers) may result in significant acquisition cost reduction. Additionally, the manufacturers of the GTL conversion reactors may wish to contribute in kind, in return for stock, for access to the demonstration project data and as product demonstration to potential purchasers.

5 <http://www.reuters.com/article/2012/10/03/us-bakkenoil-costs-idUSBRE89216D20121003>

6 <http://www.greyrock.com/products/g1000-system>

7 <http://www.bloomberg.com/news/2012-10-24/nazi-technology-turns-cheap-shale-gas-into-sub-2-diesel-energy.html>

8 <http://en.wikipedia.org/wiki/Inconel>

9 <http://en.wikipedia.org/wiki/Monel>

10 <http://en.wikipedia.org/wiki/Titanium>

- 5.3 The expected GTL conversion ratio for the smaller reactors is projected to be about 10 mmcf [million cubic feet] of gas input per 1,000 bbls of distillate liquid produced.¹¹
- 5.4 The typical shale gas well seems to produce^{12,13} about 10 mmcf cubic feet per day *TO START*, and requires about 100 thousand \$US per year in upkeep (however this cost may be inflated with “overhead” and G&A charges). Data from existing shale gas operations indicates the useful production life of a typical well to be about 20 years, however there is considerable fall-off in the rate of gas production over time, and the well may require “refracking” to restore production at about 10 years, although even after “refracking” the production rate will be low compared to the initial “surge.”
- 5.5 Thus one demonstration scale converter is expected to require one to two gas wells *to start*, however as there is both considerable variation in production, well to well, and *significant production drop-off over time*, it will be prudent to assume a higher well to converter ratio, particularly in the later years of the production life cycle. Thus while two wells with average production should be ample to start, it is likely additional wells will be required every few years. An alternative scenario is to drill all the wells at the start of the project, as site preparation is a significant expense, and multiple wells can be drilled from one site, and either “fracked and placed in service as required, or multiple converters can be initially installed. The rail transportability of the smaller modularly constructed converters to new shale gas fields then becomes an important factor, as the converters can be redeployed as the production of gas falls.

6 SGTDF's start-up and operating employment is projected to be:

6.1 Start UP (projected for 6 months)

Mainly site preparation, drilling, fracking, and converter erection/commissioning contractors. While temporary, considerable cash will be injected into the local economy through the local purchase of food, shelter, recreation, not only by the workers, but in many cases their dependents.

6.2 Operating (projected for 20 years)

Economic operation requires 24/7 operation, or 4.2 shifts per week of operating personnel, assuming 40 hours and 2 days off per week, with additional administrative and support personnel, who may not be SGTDF employees, for example employees of payroll service companies or specialty service personnel, such as certified welders. (continued)

11 <http://www.eng-tips.com/viewthread.cfm?qid=319069>

12 <http://thetimes-tribune.com/news/marcellus-gas-production-in-state-continues-steady-climb-in-2011-1.1273478>

13 <http://services.lib.mtu.edu/etd/THESIS/2012/Business&Economics/duman/thesis.pdf>

(continued)

While not requiring a Baccalaureate degree, these positions will be “high tech,” requiring considerable post-secondary education/training and operating experience, paying significantly above minimum wage, and are likely to be among the highest wages available in most isolated rural areas.

7 Intrastate economic activity and state/local tax revenues, directly and indirectly generated by the SGTDF Corporation's operations are projected to be:

7.1 As a demonstration project producing 1,000 to 1,500 bbls/day of synthetic petroleum [premium diesel/JP4], while possibly significant for the immediate area, it will not be significant in the aggregate for the state. However, if as expected, the project demonstrates the economic viability of GTL conversion, establishes an accessible knowledge base, and generates a cadre of competent GTL converter operations, the effect on the economy and local/state governmental revenues is expected to be highly significant, particularly if the “brain drain” where our best, brightest and most motivated young adults flee the rural areas of the state, frequently the state itself, for suitable employment and opportunity can be reduced or even reversed.

The economic impact of shale gas/oil production has been substantial in the areas where it has become established^{14,15,16}, and GTL conversion should promote shale/oil gas production in Kansas, as well as maximizing the value of exports and keeping the high value added, high wage, and high tax revenue generating, operations in the state.

8 SGTDF's contributions (with expansion) to the state's emergency resources and assets are expected to be significant in cases of oil embargo or other socioeconomic disruption:

8.1 A source of diesel under the control of the state of Kansas is established to provide the fuel necessary for mechanized agricultural operations, including irrigation, and food transport is operational.

8.2 A source of very high quality [ultra low sulfur] feed stock under the control of the state of Kansas, for in state petrochemical plants, for the production of critical items such as pharmaceuticals and insecticides is operational.

8.3 A source of premium [ultra low wax] JP4 jet fuel for critical aviation use, e.g. life-flight helicopter operations, under state control is available.

14 http://urban.csuohio.edu/publications/center/center_for_economic_development/Ec_Impact_Ohio_Utica_Shale_2012.pdf

15 <http://newswire.uark.edu/article.aspx?id=18558>

16 <http://www.aogr.com/index.php/magazine/editors-choice/vast-resource-potential-has-operators-gearing-up-to-test-utica-shale-format>

Additional GTL information available at

http://compactgtl.com/wp-content/documents/XTL_CGTL_May_2012.pdf

<http://www.musestancil.com/wp-content/uploads/2012/06/Gas-To-Liquids-Plants-Offer-Great-ROI-May-2012.pdf>

<http://www.epa.gov/gasstar/documents/workshops/2012-annual-conf/fleisch.pdf>

http://www2.ventech-eng.com/wp-content/uploads/2012/09/2012_09-VentechGTL.pdf

<http://www.synfuels.com/WebsiteQandA.pdf>