# Detailed explanation of request for bids.

**(A). Background.**

Kansas Sustainable Agriculture District #001 is a political-economic proto type demonstrating a new model of rural economic development financed by external "green" investors. In this model, a publicly owned biomethane plant from which the CO2 byproduct stream is sequestered creates:
(i). local markets for agricultural commodities used as feedstocks,
(ii). reduced cost renewable fuel for local farmers' vehicles, and
(iii). good jobs in rural communities.

The primary revenue driver for biomethane in the USA is that most renewable natural gas (RNG) that has been sold for use as "transportation fuel" qualifies for the highest value category D3 of "renewable identification numbers (RINs)" which petroleum refiners are obliged to buy in quantities commensurate with their production. The theoretical "demand" for D3 RINs is defined by US law passed with bi-partisan support as 16 billion per year. However, because the actual supply is far less than this amount, the Environmental protection agency (EPA) sets a "target" each year which is intended to approximate the actual supply. To the extent that supply is less than this "target," the maximum price is capped at $3.50. The announced target for 2025 is 2.13 billion. This far exceeds the projected supply from projects "in the pipeline" now because EPA is actively encouraging expansion of capacity.

Because the existing demand for compressed natural gas (CNG) vehicle fuel is already mostly (75%) provided by existing RNG production, prospective increased supply of D3 RINs from RNG has previously been expected to come primarily from biogas plants used to create electrical power that is then sold as "transportation fuel." However, expansion of D3 RIN supply from RNG can also be achieved if rural consumers, i.e., farmers, *create demand for RNG vehicle fuel made from their own agricultural commodities*.

Notwithstanding near-saturation of existing CNG vehicle fuel demand in the USA with RNG, new RNG plants that have particularly attractive "carbon index (CI)" should be able to secure offtake agreements for production for as long as it takes until local RNG demand equals local RNG production. With sequestration of byproduct CO2, RNG from "agricultural digesters" should have very attractive "carbon negative" CI numbers.

Kansas Sustainable Agriculture District #001 is a "rural improvement district" organized under Kansas law, K.S.A. 19-2753 - 2782 (1). Forty-one landowners in Kingman county (farmers) petitioned county government according to requirements of the law in order to have their land incorporated into such a district, which is a political subdivision of county government with elected directors. These districts are authorized to issue tax-free bonds to finance "revenue generating projects" (K.S.A. 19-2775 and 19-2776)(1). These bonds are expected to be attractive to "green" investors on philosophical grounds, regardless of their rate of return. However, before such bonds can be issued, the District must obtain an "engineer's report" certified by a registered Kansas engineer (K.S.A. 19-2767)(1). This requires "plans and specifications" as well as "a written report … showing the amount, character and kind of work to be done and the location and probable cost thereof, and if the works are of revenue producing nature the engineer shall include in his report his findings as to operating and maintenance costs and number of customers required to make the works self-liquidating within a reasonable period." The "customers" in this case

are farmers entering into biomass supply agreements with the plant. In order to provide a proper "engineer's report," a biomethane plant project should be sufficiently developed to inform an investment decision, i.e., to define a guaranteed maximum price for the project construction and commissioning.

The bid requested is for the amount to be charged for this project development/ engineering culminating in an "engineer's report" certified by a registered Kansas engineer.

Note that the usual logic of "business case" is inverted in these circumstances, where the purpose is to promote sustainable rural economic development while servicing bond debt.

**(B). Project details.**

Kingman county is home to one of only three CNG fueling stations in all of Kansas west of Wichita. There is already significant local market penetration of "dual fuel" pickup trucks which can run on either CNG or liquid fuel. We estimate that if 2/3 of the pickup trucks in the county are converted to dual-fuel, that will more-or-less correspond to the annual production of the planned biomethane plant. District #001 intends to apply net revenues to "dual fuel" conversion of members' vehicles (including subsidization of the "dual fuel" factory option available on all new US-made pickup trucks and of the increased cost compared with their diesel-fueled equivalent for methane-fueled tractors which are now commercially available in the USA, and which can be re-fueled via rural-user pipeline taps). Kansas law provides a mechanism for adding new members to the District.

The plant site (2) is comparatively flat, 16.2 hectares (40 acres) situated between two different interstate gas pipelines (colored purple in the picture) which feed into the Calista compressor station, situated on the adjacent property to the northeast.

The water supply is wastewater effluent from the nearby city of Kingman (population ca 2,600) delivered by truck. Some additional, potable water supply will be available from a new well which will be permitted to draw no more than 17 $m^3$/day.

Source of electrical power is open to discussion. Use of Kansas commercial transmission power is highly disadvantageous in terms of "carbon footprint" compared with on-site generation using pipeline gas. Use of biogas for this purpose is economically disadvantageous. Some waste heat may be available from the neigboring pipeline compressor station. Geothermal and solar sources are readily available. A virtually unlimited supply of no-cost wood chips is also available because the District provides, to its members, as a service, clearance of invasive, non-indigenous trees. A lingering consequence of windbreaks planted in the 1920s to ameliorate rampant soil erosion, these invasive species did not come to grow in the Kansas "high plains" by any "natural" process. They consume precious water, choke-out arable farmland and are a constantly expanding nuisance. The "carbon footprint" costs of using these wood chips have not yet been determined - these could be high if "land use change" penalties are applied. Conceivably, such penalties could be offset by a concerted effort to replace nuisance trees by planting desired trees at some other location. However, that would add considerable cost.

The feedstock supply is predominantly grass silage with some comparatively dry cow manure and some co-digested nitrogen-rich wastes (including a mixture of meat-rich food

wastes as well as some traditional slaughterhouse wastes). The estimated quantities are given in the bid notice.

The grass is second-crop "cover crop" grass planted after the primary crop harvest. Cultivation of second-crop grass is actively encourged by the US Department of Agriculture as an effective means of promoting soil "health" and avoiding erosion. The District has biomass supply agreements currently covering 15,000 acres but expected to reach 22,000. Under the terms of these agreements, the District organizes the harvest, transport and ensiling of the grass in bunkers at the plant site using RNG-fueled vehicles and at no cost to farmers. Note that fuel consumption is of little concern economically, since D3 RINs are earned for RNG that is consumed by the District's trucks and harvest machinery.

The cow manure is comparatively dry, recovered from "wintering stands."

The plant must be able to run with alternative biomass supply configurations in case of "drought emergency" years, presumably including some mixture of urban grass clippings, food waste and organic fraction of municipal waste from Wichita (population 0.5 M, 80 km distant).

The gas pipeline quality standards are shown in (3). The operating pressure is typically between 400 and 600 psi. The maximum oxygen content is extremely low at 0.01%. This is a particularly irritating "red tape" aspect in that the One OK line that feeds into the Calista compressor station at exactly this point has 0.05%. However, One OK will not permit us to inject at this location. Kansas Gas Service has been considering making a more reasonable standard which conceivably could be in place by the time the plant is built.

CO2 sequestration can be achieved lawfully without requirement for a Class VI permit from EPA via Class II wells used in the oil-and-gas industry. These are plentiful in Kansas (4), Oklahoma and Texas. CO2 from the Kingman plant will be delivered by RNG-fueled trucks to a nearby oil field and dissolved in a large quantity of petroleum production brine that is produced and disposed of daily. Details of the CO2 disposal are outside the scope of the requested "engineer's report," which needs only to account for capture of the CO2 byproduct stream in trailers for transport.

In addition to enhancing attractiveness of the District's RNG for an eventual off-take agreement, CO2 sequestration is, itself, a source of revenue under the tax credit provided by 26 USC 45Q which the District can receive as a direct cash payment. CO2 sequestration is also expected to increase attractiveness of the project for private "carbon credits." For example, Charm Industrial (see https://charmindustrial.com/) receives huge private payments for sequestering CO2 in Kansas by converting agricultural residuals to bio-crude oil which, instead of being used for renewable fuel production, is simply injected into abandoned oil fields. Through 2027, instead of claiming the 45Q credit (expected to be on the order of $1 M per year after paying royalties to the CO2 disposal partner oil-field) the District can receive the "clean fuel" production credit provided by 26 USC 45Z (which is expected to be on the order of $6 M per year after royalties).

Blue Flame Biopower LLC, directed by Robert C. Casad, Jr., Ph.D., J.D. is the District's agent under contract to provide technical management of the plant using the District's employees as well as brokering of RINs, RNG and private carbon credits.

**(C). The District's plan of action in financing the plant.**

The Kansas Sustainable Agriculture District #001 biomethane project in Kingman county and its replication in neighboring Sumner and Harper counties will be listed by the state of Kansas on its "Priority Climate Action Plan (PCAP)" to be submitted to EPA by March 1, 2024.

Accordingly, the project (and its replication) will be eligible to compete for $4.3 billion in funding under EPA's "climate pollution reduction implementation grant" funding opportunity (5) for which applications are due April 1, 2024.

Kingman county is eligible to submit a tier C application ($50-100 M), to be provided by Blue Flame Biopower, most of which, if funded, can be sub-awarded to Kansas Sustainable Agriculture District #001, less cost of county road improvements to facilitate truck access to the plant site. The grant application will explain that the District will pledge a share of revenues going forward (on the order of what bond payments would have been) to a Kansas Sustainable Agriculture fund maintained by Kingman county having the purpose to support replication of the model in Harper and Sumner counties.

Grant awards will be announced in July, 2024. Successful applicants will receive funding beginning October 1, 2024.

If the Kingman county application is successful, the successful bidder for the required "engineer's report" will be empowered to "just do it" (design and then build the plant) beginning October 1, 2024.

If the Kingman county application is not successful, the selected bid will, nevertheless, provide the basis for securing project development funds in the context of a definite, documented path to eventual lawful issue of a tax-free bond with which to finance the plant.

**(D). Bidder qualifications and selection criteria.**

Qualified Providers are companies competent to design, build and commission biomethane plants with the assistance of one or more engineering, procurement and construction (EPC) contractors operating in the USA.

To the extent that contributions from EPC contractors are an integral component of a bid for the "engineer's report" which requires project development and engineering sufficient to determine a guaranteed maximum price, Qualified Providers should obtain estimates from their preferred EPC contractor to inform their bid.

As a political subdivision of county government, Kansas Sustainable Agriculture District #001 is complying with procurement rules that apply to county governments. The District will accordingly select the "lowest and best bid."

The criterion for determination of "lowest bid" is simply the amount bid in dollars.

The criteria of "best bid" are:

(i). Experience in design, construction and commissioning of biomethane plants, generally.
(ii). Experience in design, construction and commissioning of biomethane plants using grass silage as a significant component of feedstock.
(iii). Range of estimated methane yield results, OLR and residence times obtained previously with grass silage feedstock in plants that the bidder designed and built.
(iv). Actual methane production output and final capital cost of commercial biomethane plants that the bidder designed and built where grass silage was a significant feedstock.
(v). Asserted ability, given funding, to complete the prospective entire project including design through commissioning expeditiously (ideally within 27 months).

Qualified Providers are kindly asked to include, along with their bid, a brief description of their company and a resume of its experience designing, building, commissioning and operating biomethane plants, generally, but also highlighting any examples where grass silage was a significant (preferably primary) feedstock. Ideally, completion dates, production capacities and final capital cost of plants can be provided.

Qualified Providers are also kindly asked to provide the following specific information:
(1). Range of estimated methane yield results, OLR and residence times obtained previously with grass silage feedstock in plants that you designed and built.
(2). Actual methane production output and final capital cost of commercial biomethane plants that you designed and built where grass silage was a significant feedstock.

Attachments:
1. Relevant excerpt from Kansas law concerning “rural improvement districts.”
2. Kingman county biomethane plant site.
3. Kansas Gas Service pipeline injection quality standards.
4. Map of Kansas showing locations of Underground Injection Control (UIC) Class II wells.
5. EPA Funding Opportunity Announcement