

Giant King Grass: Dual Use Crop Animal Feed & Bioenergy



Clean Energy for a
Cleaner Tomorrow



Giant King Grass Cut Short for Animal Feed

1 Megawatt Biogas Power Plant

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- VIASPACE with a Nicaraguan partner is developing a 12 MW biomass power plant and 2100 acre Giant King Grass plantation. Also for animal feed.



- A VIASPACE partner is developing a 7 MW anaerobic digestion biogas power plant on St. Croix, Virgin Islands
- A VIASPACE partner is developing a 1.6 MW anaerobic digestion biogas power plant in an island nation

Giant King Grass



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- Highest yielding crop in the world
 - More tons per acre means low cost
- Perennial for 7-10 years
 - Promotes subsoil environment
- Needs warm weather—no freezing, sufficient rainfall or irrigation-4"/mo
- Similar to growing sugarcane
- Will grow on marginal land and displace food crops
- Not genetically modified
- Use for animal feed and bioenergy
- Has passed quarantine and is growing in Hawaii (HARC), California, St. Croix and eight countries



Where is Giant King Grass Biomass Applicable?



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- Where electricity is needed
- Where current electricity is generated from oil or liquefied natural gas
 - Giant King Grass electricity is reliable like oil, but substantially less expensive
 - Biomass energy is zero carbon dioxide
 - Not intermittent like solar or wind
- Where domestically grown animal feed is important
- Where there is sufficient land and rainfall or irrigation to grow Giant King Grass

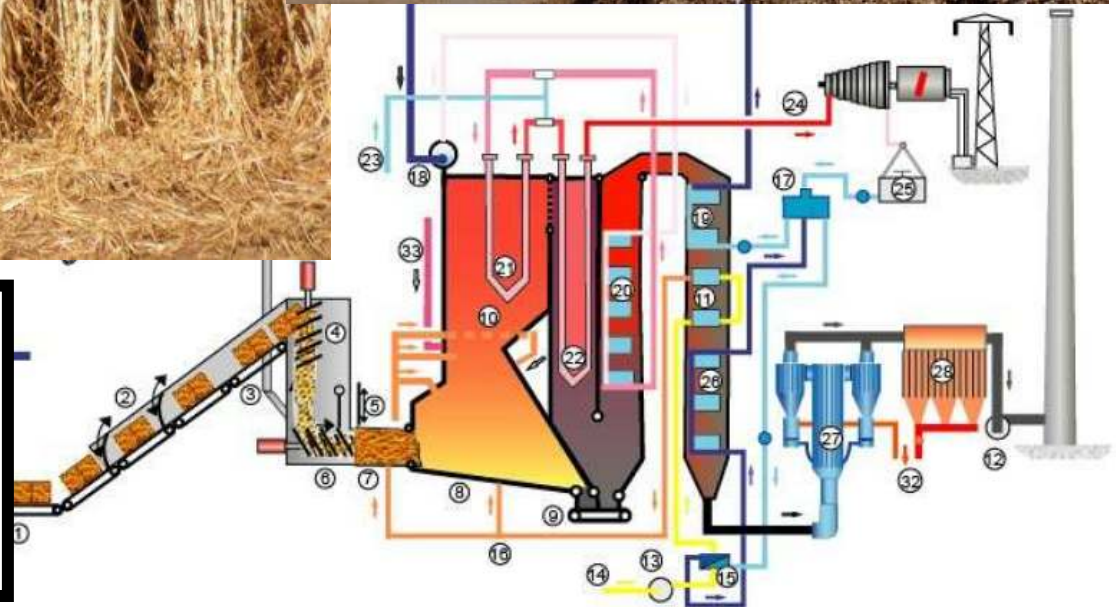
Giant King Grass for Electricity Direct Combustion



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**Harvest every six months
at 14-18 ft tall and dry to burn in
power plant.
10 – 35 MW requires 1750 –
6125 acres of Giant King Grass**



Giant King Grass for Electricity Biogas from Anaerobic Digestion



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Harvest every 60-90 days at 7-10 ft m tall and cut into small pieces for anaerobic digestion to produce biogas which fuels an engine generator to produce electricity. Drying is not necessary. Same Giant King Grass is excellent animal feed. Biogas power plants are 1-4 megawatts with 250 – 1000 acres of Giant King Grass

GKG is Good Feed for Dairy Cows, Cattle, Camels, Goats, Sheep & Horses

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**Cut at 5-7 ft tall at
45-60 days**

**Cut & carry, or
potentially
Intensive grazing**

**Fresh, silage, hay,
Meal or pellets**



**Part of
diet for
pigs,
rabbits
& fish**



Giant King Grass Nutrition



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- Excellent nutrition--ideal for ruminants-cattle, sheep, goats & camels
- Also for horses, pigs, rabbits and some fish
- Better than oat hay
- High yield means low cost
- Reduces need for expensive alfalfa, grains and concentrates in a mixed ration feed
- Can be used as fresh chop, silage, hay, meal or pellets



Dairy One

Components	As Fed	DM
% Moisture	77.2	
% Dry Matter	22.8	
% Crude Protein	3.0	13.3
% Available Protein	2.9	12.5
% ADICP	.2	.8
% Adjusted Crude Protein	3.0	13.3
Soluble Protein % CP		38
Degradable Protein%CP		66
% NDICP	.8	3.6
% Acid Detergent Fiber	8.9	38.8
% Neutral Detergent Fiber	15.3	67.0
% Lignin	1.1	4.8
% NFC	2.0	8.8
% Starch	<0.1	.2
% WSC (Water Sol. Carbs.)	1.3	5.6
% ESC (Simple Sugars)	1.3	5.6
% Crude Fat	.5	2.1
% Ash	2.82	12.35
% TDN	13	58
NEL, Mcal/Lb	.11	.47
NEM, Mcal/Lb	.12	.51
NEG, Mcal/Lb	.06	.25
Relative Feed Value		81

Advantages of High Yield Giant King Grass



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Animal Feed

- Beef cattle in typical tropical pasture— 2 acres per head or 0.5 head/acre
- Giant King Grass --cut and carry the grass or potentially use intensive grazing— 4.9 head per acre
 - This is due to the high yield of Giant King Grass with sufficient rainfall or irrigation
- Dairy cows with Giant King Grass fresh chop or silage— 3.5 cows per acre
- Manure could be collected and co-digested with Giant King Grass produce biogas electricity & organic fertilizer

Electricity Generation

- 30 MW Giant King Grass power plant needs 5200 acres—2100 ha
- Concrete example--Would provide 10% of the big island's (Hawaii) base electricity need using 2/10 of 1% of the land area
 - at substantially lower cost
- Giant King Grass grows well where sugarcane can be grown, but needs sufficient rainfall or irrigation—4 inches per month
- Giant King Grass provides jobs for farmers

Giant King Grass Benefits



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- Provides reliable 24/7 electricity
- High yield, high nutrition animal feed
- Plantation provides jobs for farmers
- Power plant provides quality jobs
- Less expensive than oil or liquefied natural gas
- Money stays in country rather than going overseas to pay for oil
- In the future, can produce liquid biofuels to replace transportation fuel

VIASPACE is Seeking



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- Development and financing partners for power plant and animal feed projects worldwide
- VIASPACE can provide
 - Giant King Grass dedicated energy crop
 - Technical expertise
 - Experienced power plant partners
 - Project financial models
 - Management
- Local in- country partner provides
 - Land
 - Local business and government connections for support and permits
 - Power purchase agreement
 - Farming operations/ management
- Project feasibility study funding
- Project debt and equity financing



Thank You



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- Publicly traded US company with stock symbol VSPC
- Grows renewable Giant King™ Grass as a low-carbon fuel for clean electricity; for energy pellets; and as a feedstock for bio-methane, cellulosic biofuels, biochemicals and biomaterials.
- Giant King Grass is also excellent animal feed with 10 – 15% crude protein.
- Giant King Grass is being grown in California, Hawaii, St. Croix Virgin Islands, Nicaragua, South Africa, China, Myanmar, Pakistan and Guyana.
- VIASPACE, in cooperation with local partners, can deliver an entire bioenergy solution including the Giant King Grass energy crop plantation and the power plant.