



# Renew Energy and Viaspace Giant King Grass to biogas

April 2013 by Morten Jacobsen

At The International Biomass and Expo  
Conference, Minneapolis, MI



# Presenter

## Morten Jacobsen

- Chief project manager at Renew Energy
- 15 years experience with biogas engineering
- Extensive international experience
- 6 years experience in working with biogas projects in the US
- B. Sc. in mechanical engineering from the university of Southern Denmark
- Degree in Business Administration from University of Southern Denmark

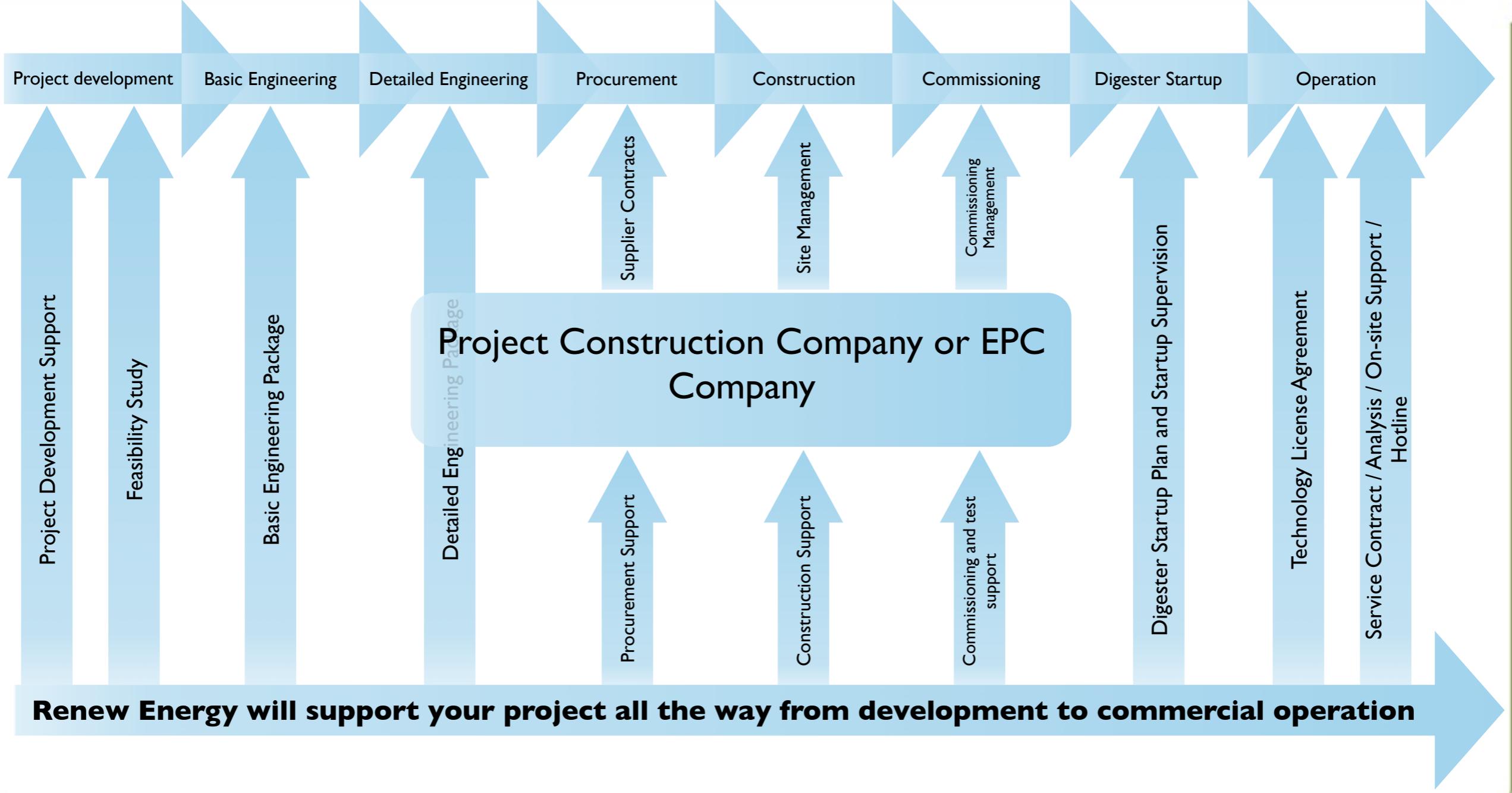


# Renew Energy A/S

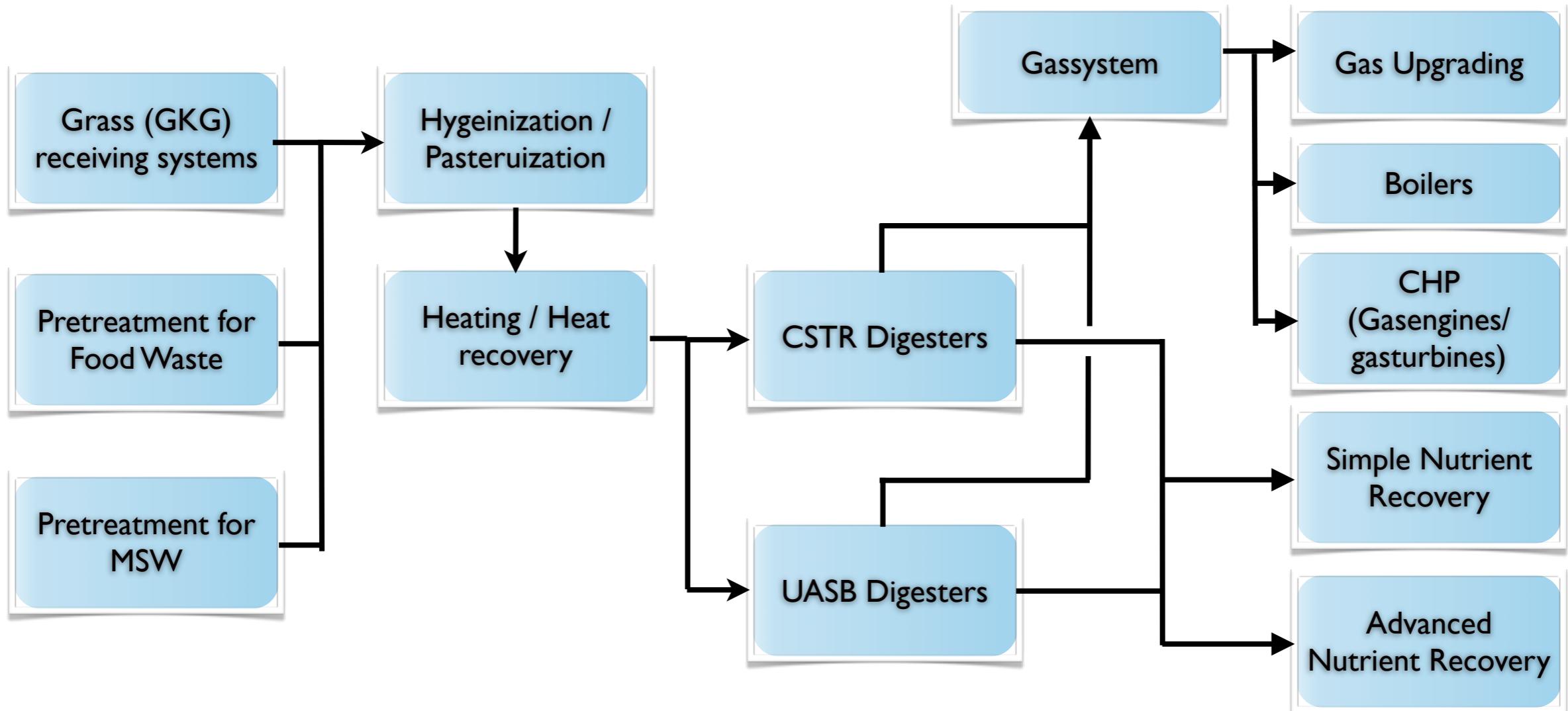
- Focused engineering services company based in Svendborg, Denmark
- Established 2007
- Provide economically and environmentally sustainable biorefinery solutions
- 20 years experience in sector.
- International operations
- Main business areas:
  - biogas plants,
  - biogas/separation plants, and
  - biorefinery plants integrated with ethanol plants, distilleries and other industrial plants.



# Renew Energy Business Plan



# Renew Energy Technology

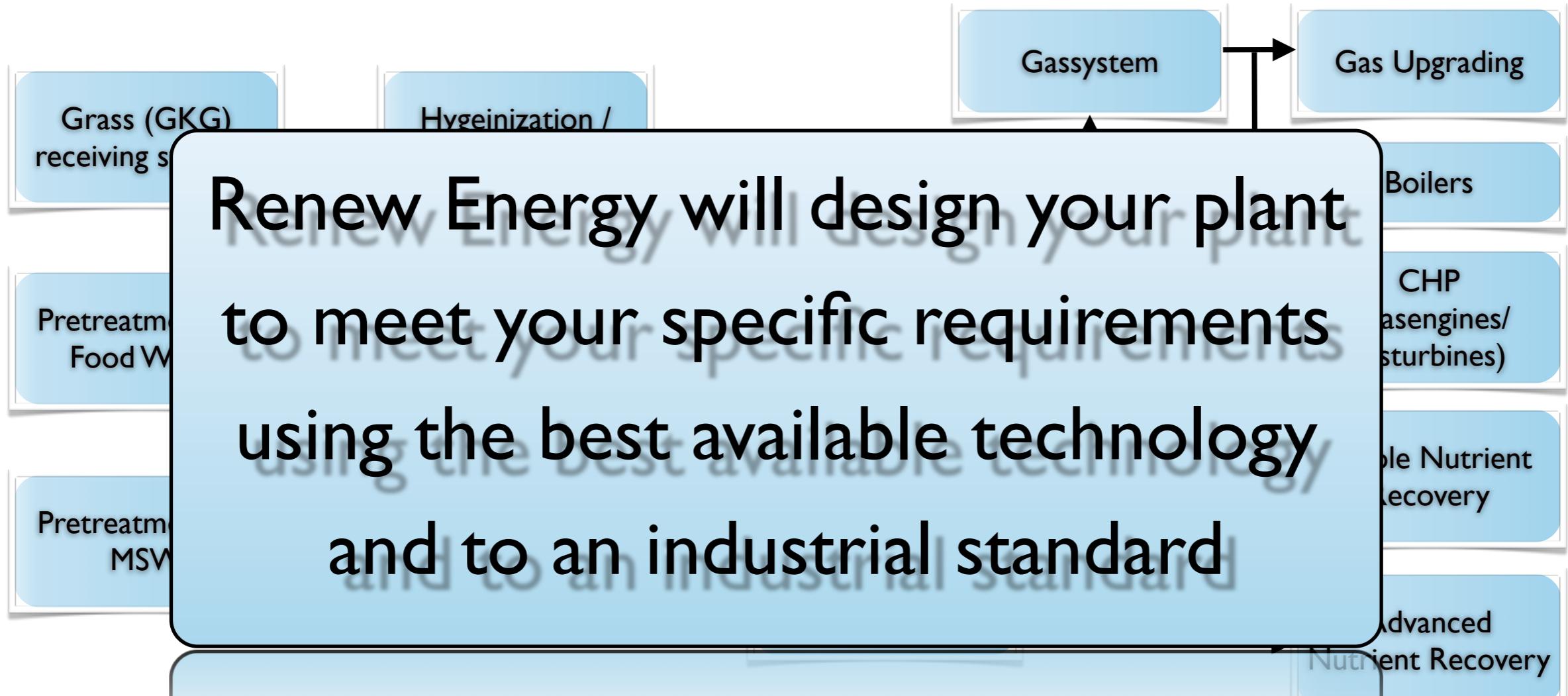


Renew Energy will design your plant to meet your specific requirements using the best available technology and to an industrial standard

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**qnew**  
energy

# Renew Energy Technology



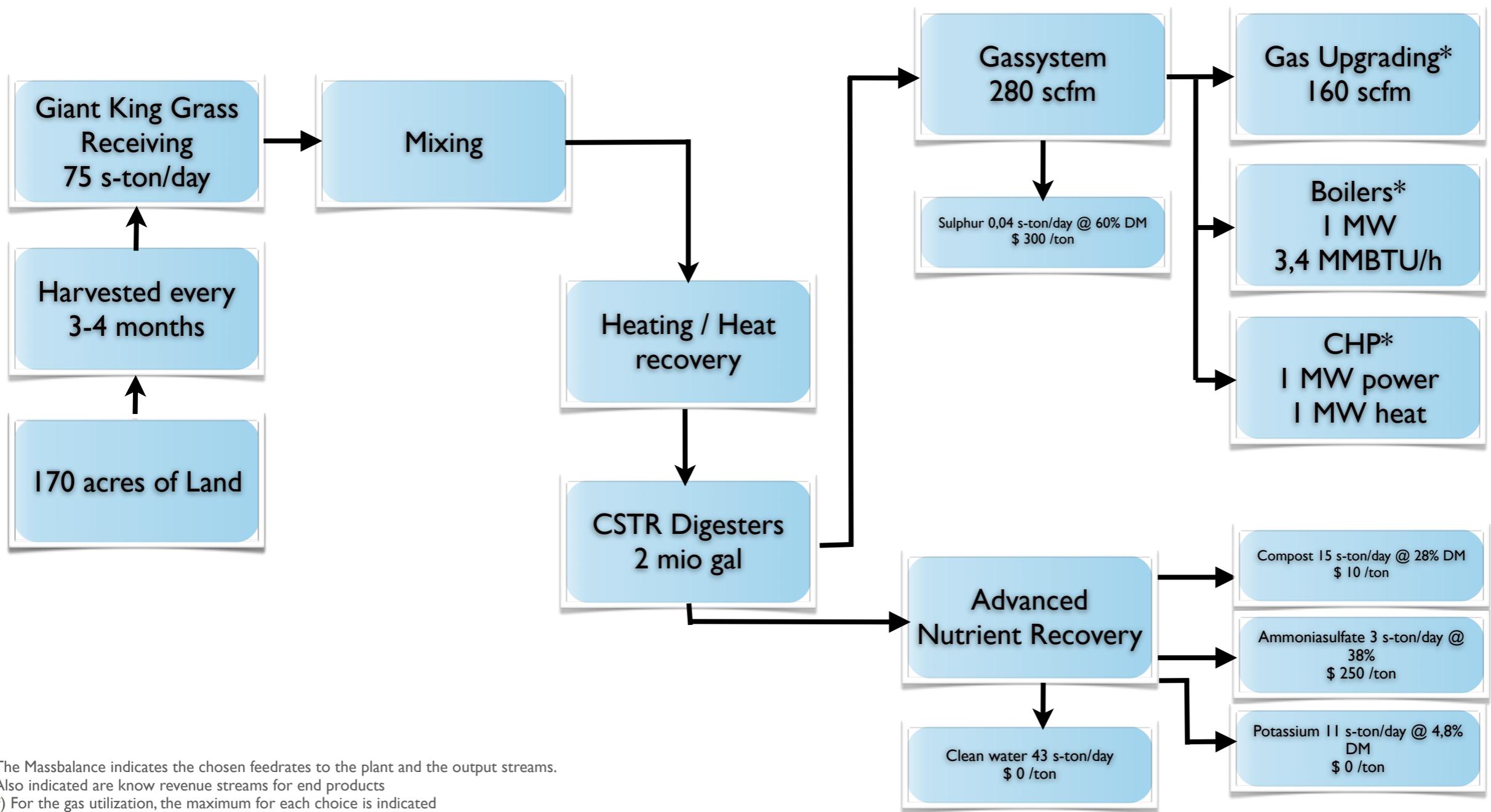
# Giant King Grass



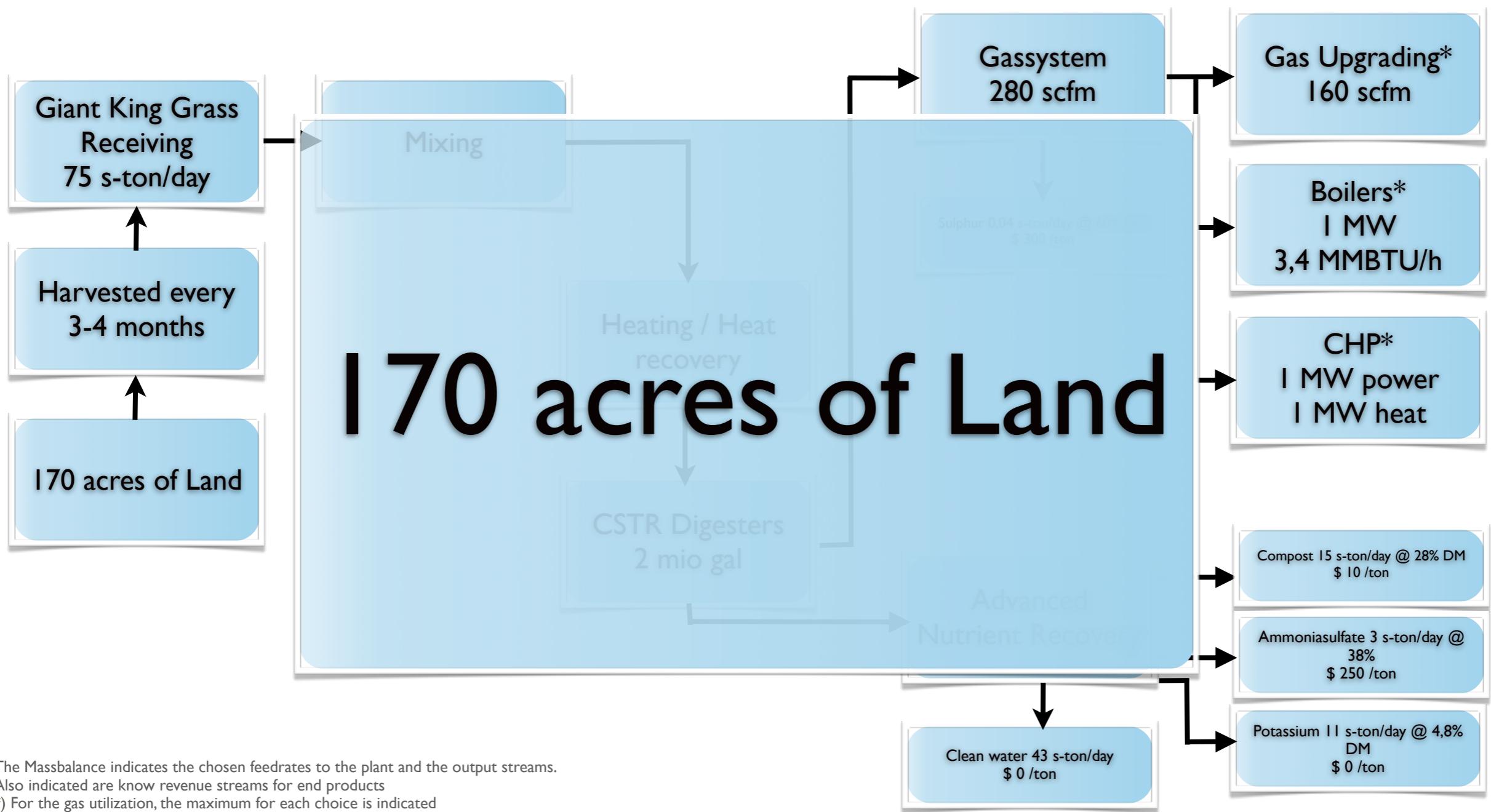
# Giant King Grass



# Renew Energy **Giant King Grass** Model Project



# Renew Energy Giant King Grass Model Project

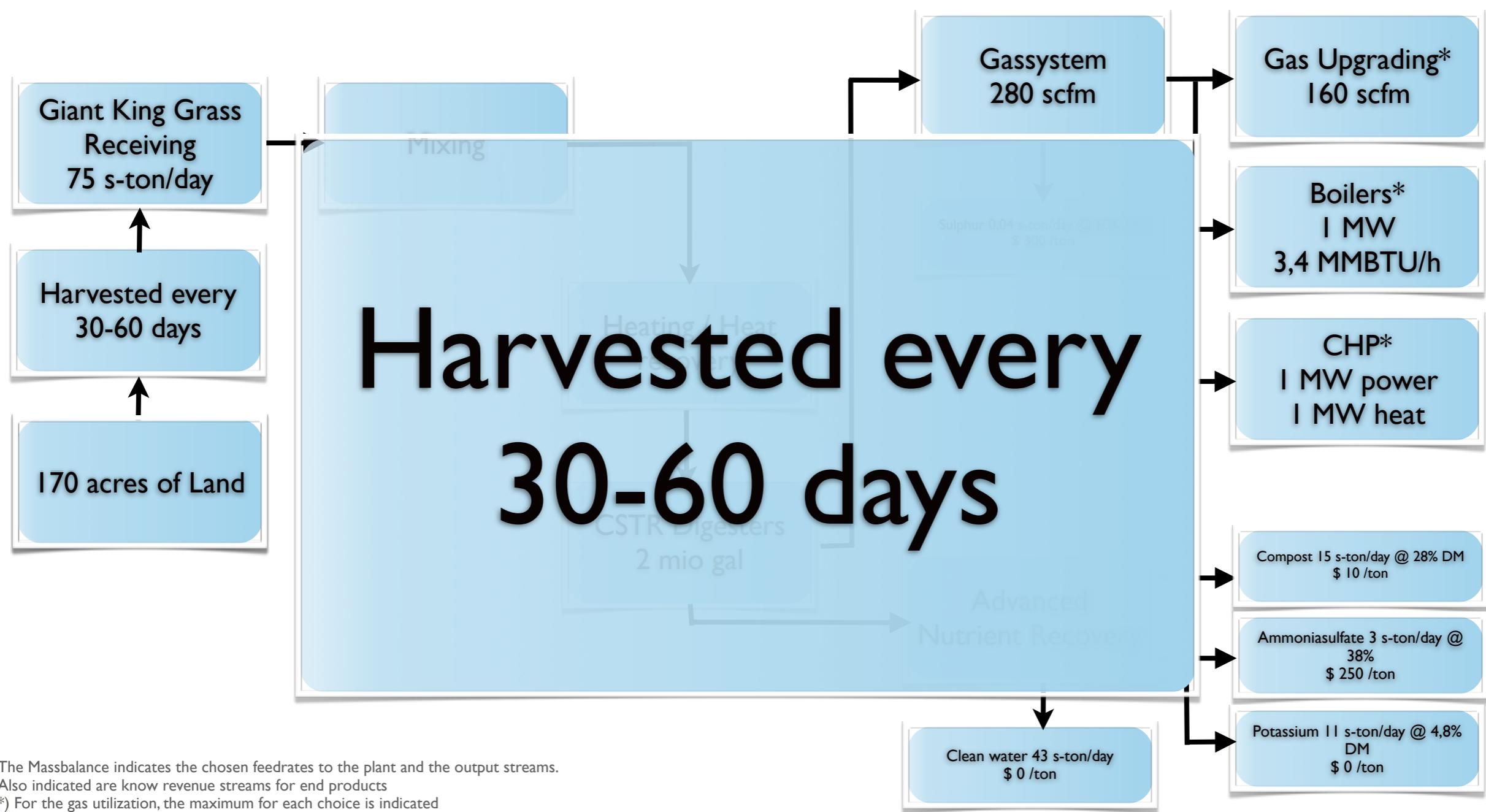


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# GKG Harvesting



# Renew Energy **Giant King Grass** Model Project



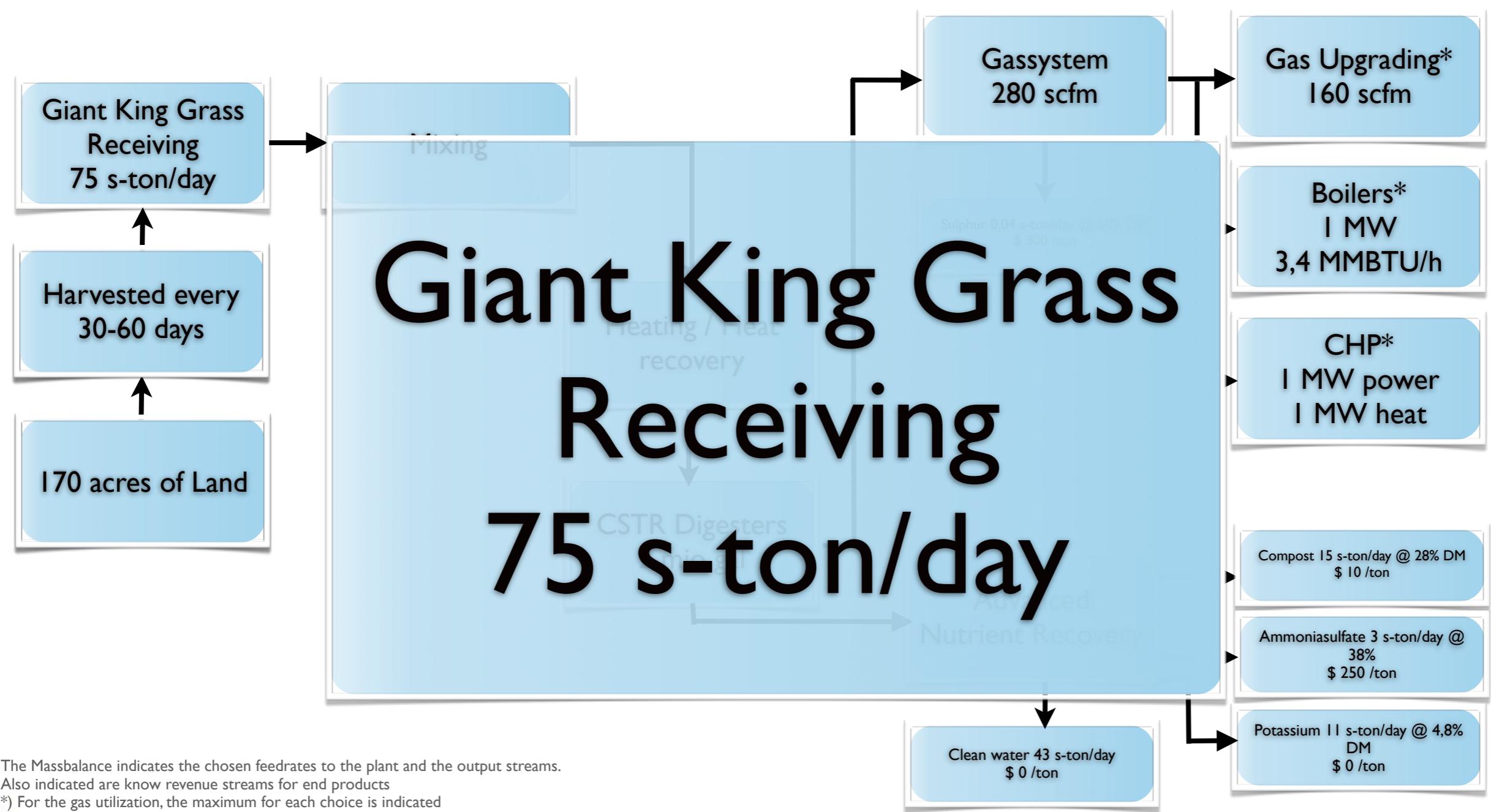
# GKG Harvesting



# GKG Harvesting



# Renew Energy **Giant King Grass** Model Project



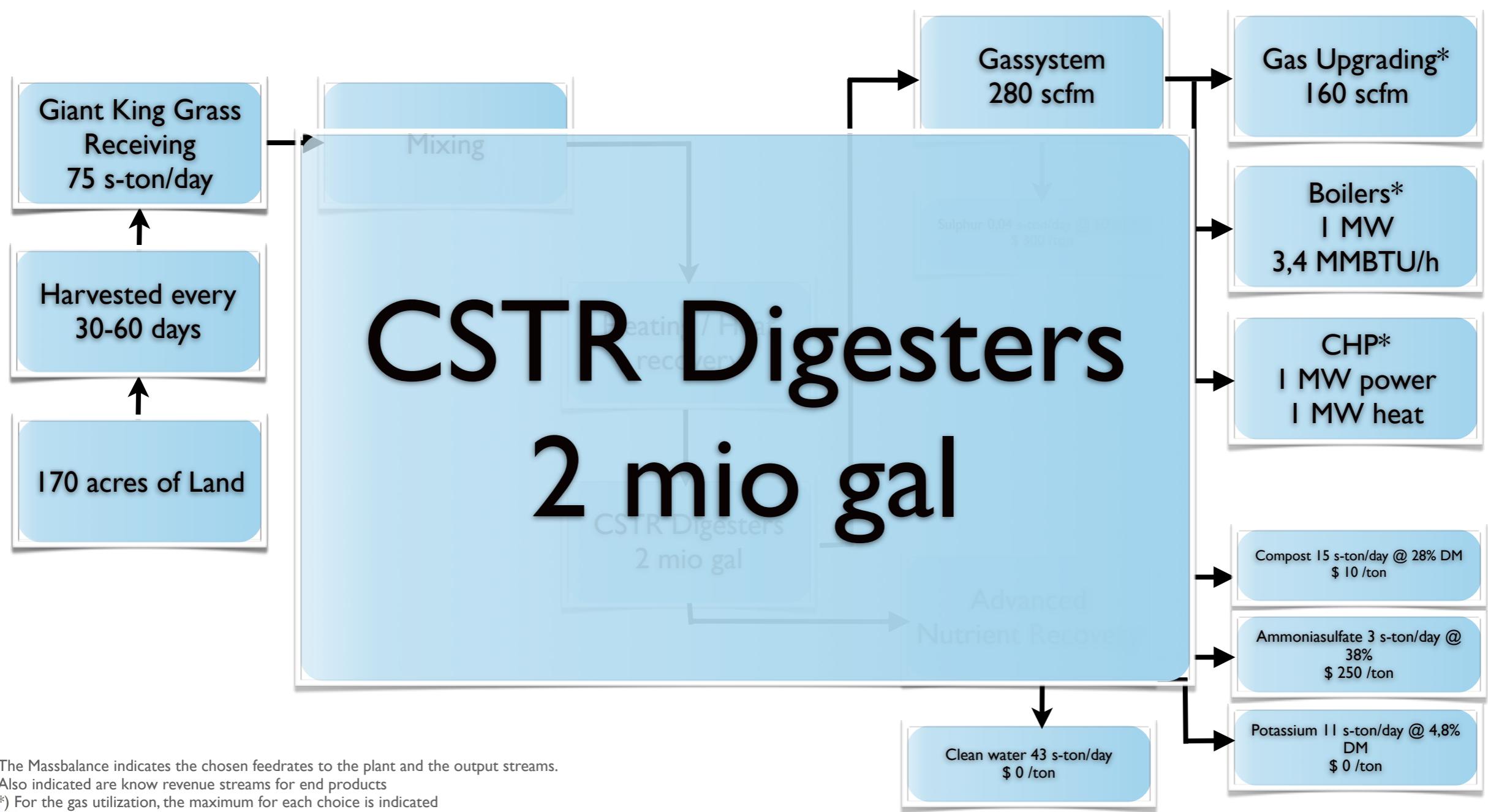
# GKG Receiving equipment



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# Renew Energy **Giant King Grass** Model Project



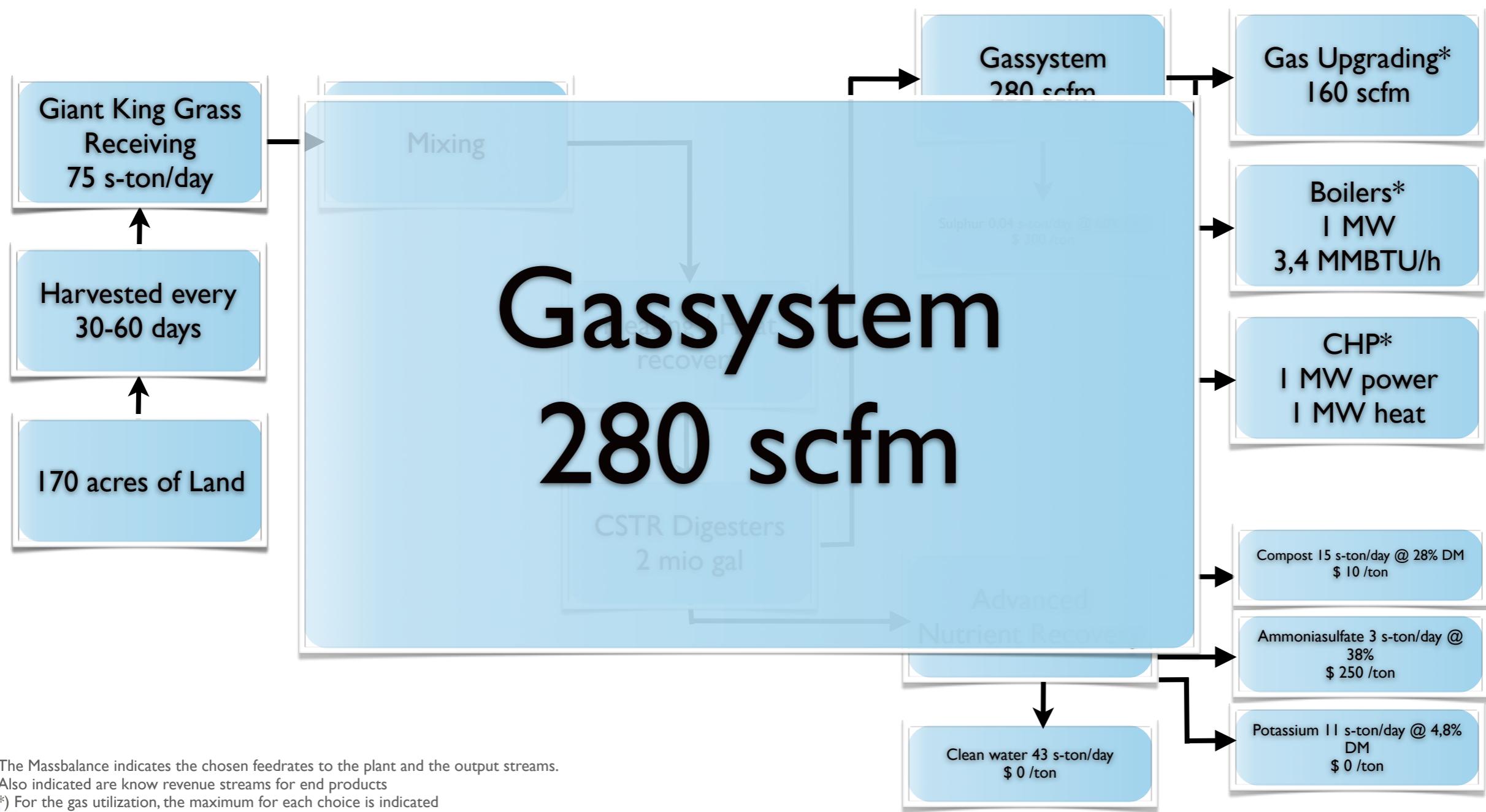
# CSTR Digesters



# CSTR Digesters



# Renew Energy **Giant King Grass** Model Project



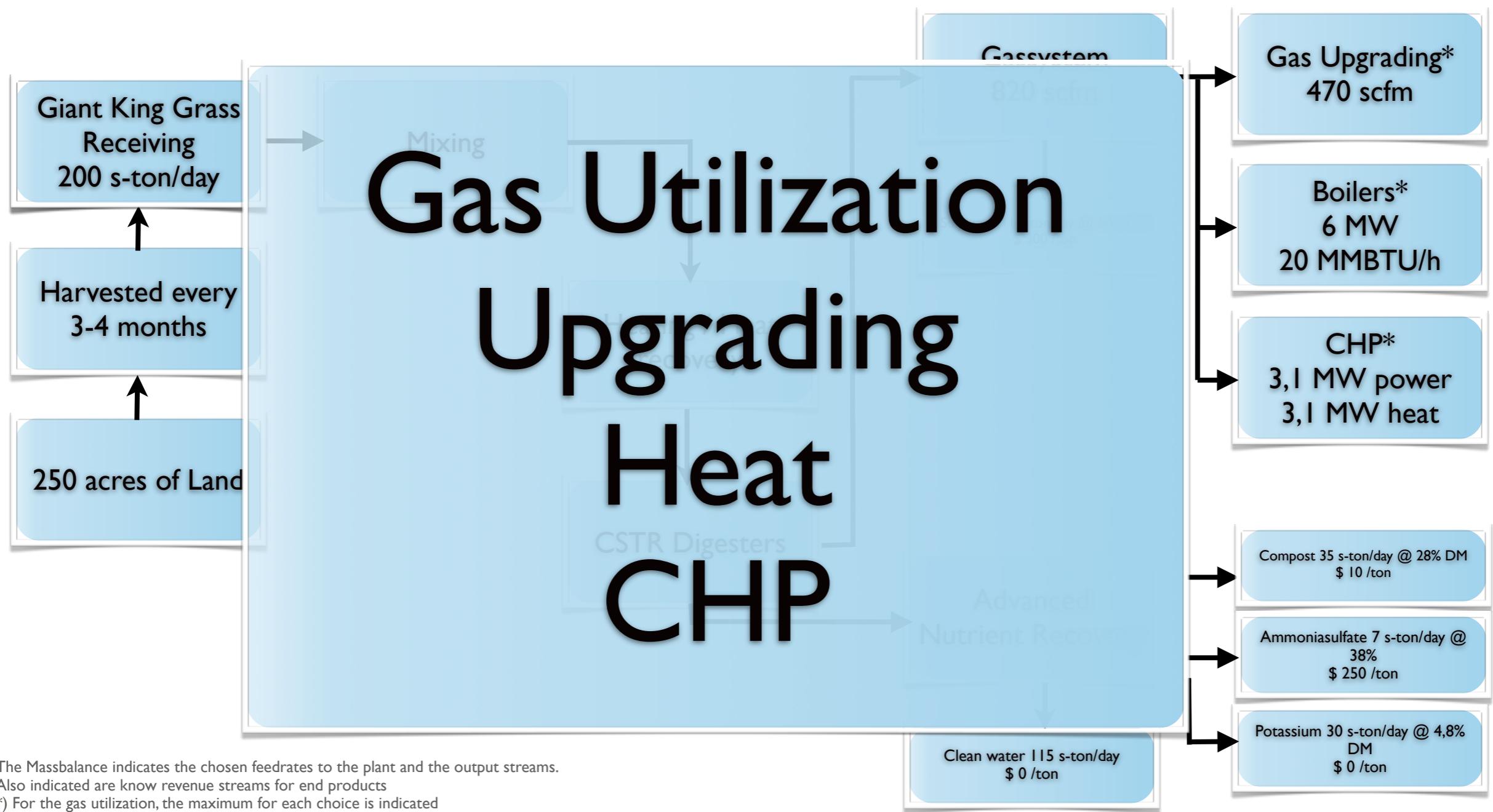
# Gas System



# Gas System



# Renew Energy Giant King Grass Model Project

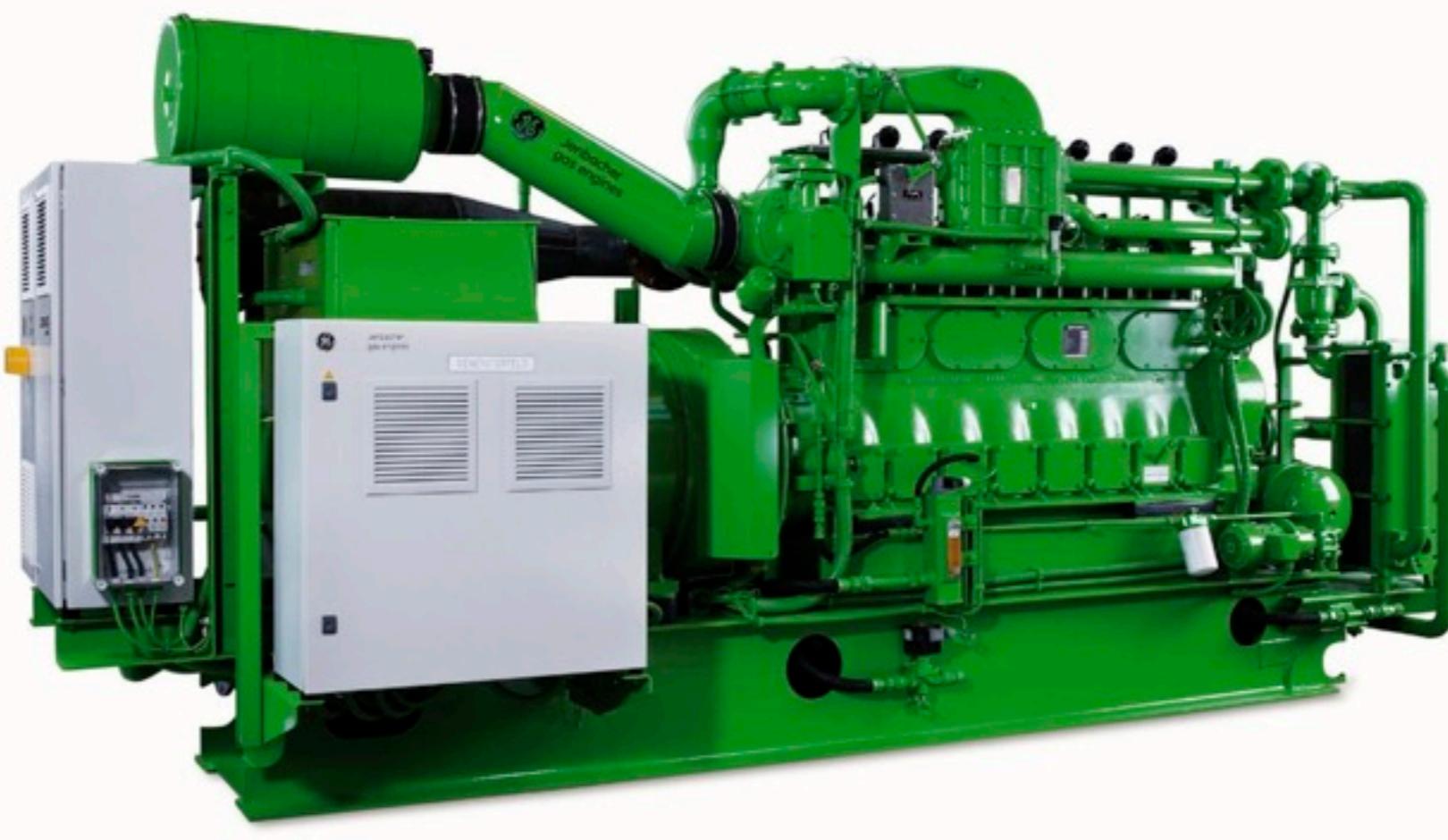


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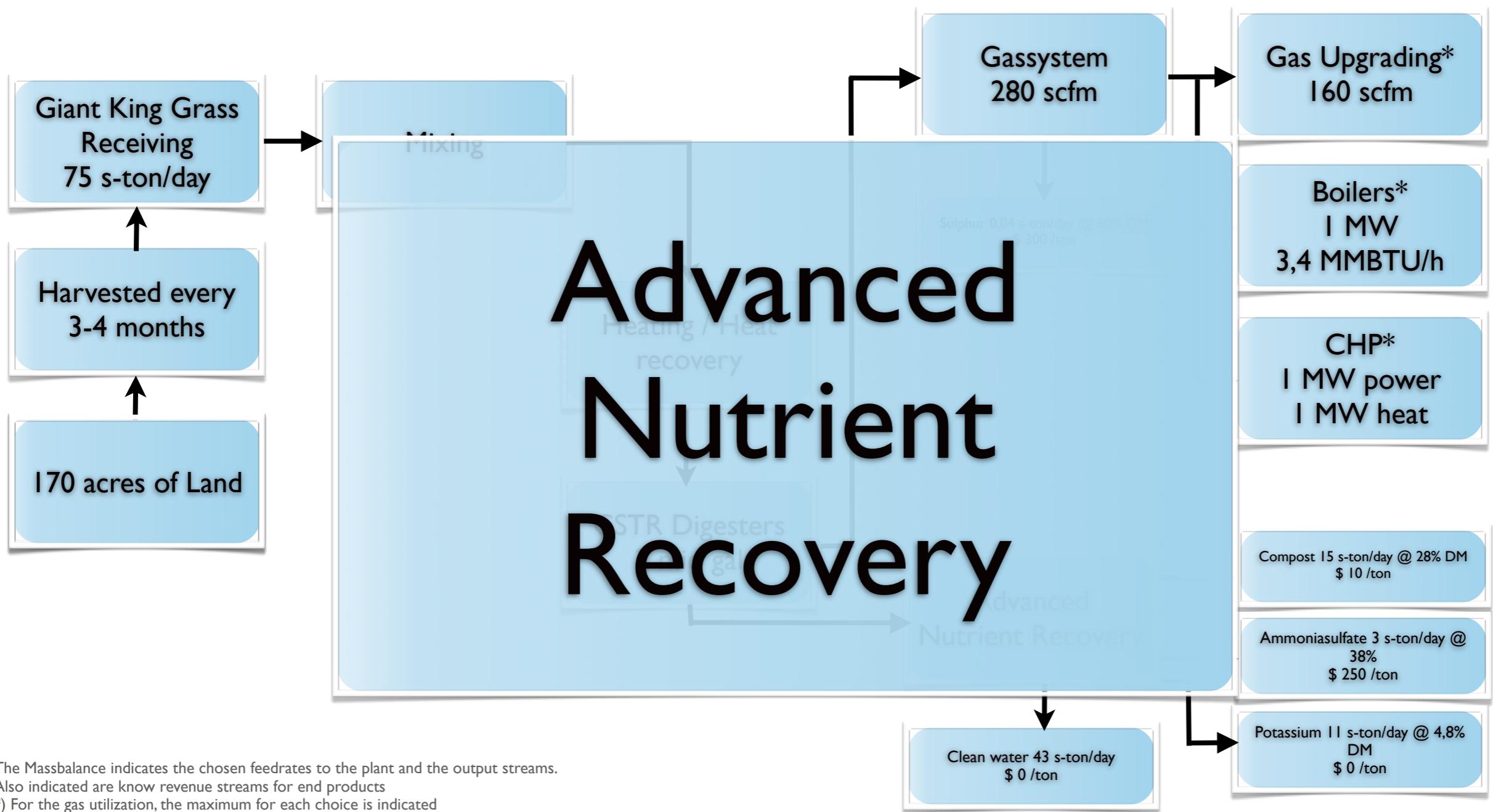
# Gas Utilization



# Gas Utilization



# Renew Energy Giant King Grass Model Project



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# Nutrient recovery

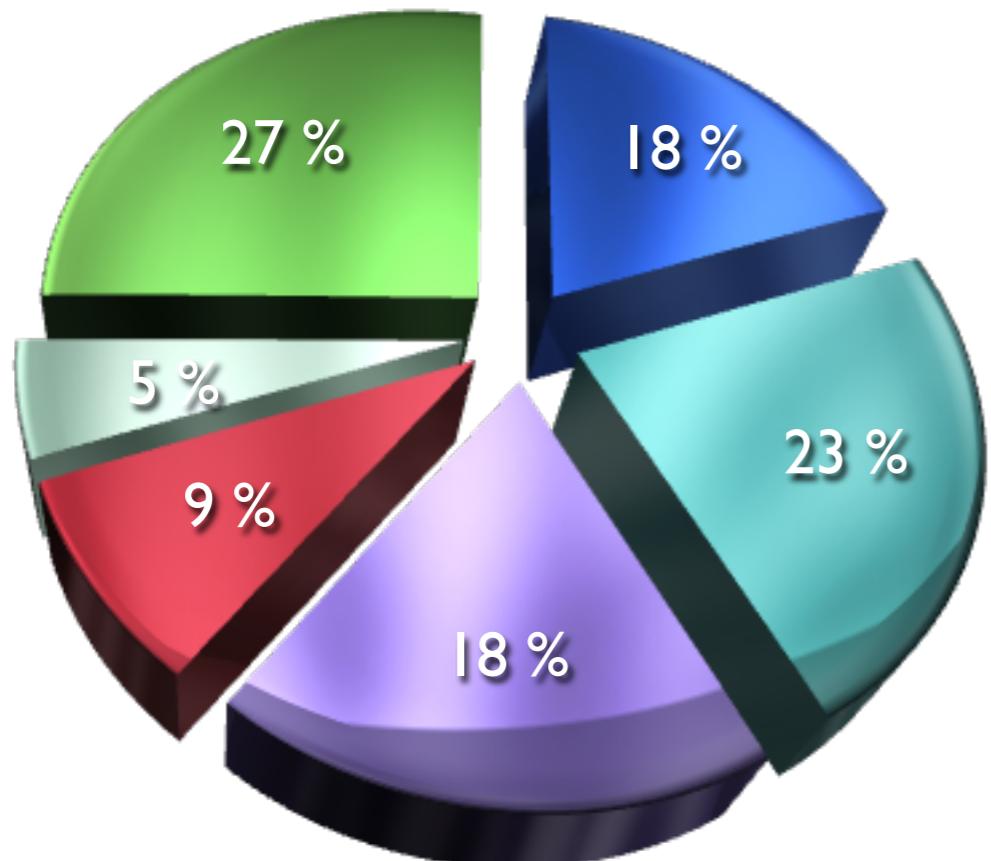


# Nutrient recovery



# Renew Energy Model Project

## Capital Cost



- Pretreatment and Digesters
- Gassystem and Gas utilization
- Advanced Nutrient Recovery
- Balance of Plant
- Renew Energy Engineering
- Civil and Other

Total project cost with  
CHP  
\$ 7,000,000 -  
15,000,000

12'000'000

All numbers are ballpark figures, not for project budgeting  
Total budget is for model project. Local conditions can influence  
the budget beyond what is indicated here

# Renew Energy Model Project

## Time line from idea to operation

Project Development	6-12 months
Basic Engineering	4-5 months
Detailed Engineering	3-4 months
Procurement	2-4 months
Construction	8-12 months
Commissioning	3-5 months
Digester Startup	3-4 months
First year operation, performance improvements	12 months
Total project time	41-58 months

The time schedule indicates a typical timeline for a biogas project, however local conditions can impact the time schedule



# Renew Energy A/S – Selected Reference Projects



# Renew References Fremont Community Digester

## Technical Data

- Feedstock Multi-varied
- Biogas production 300 ton/day
- Power production 32.100 Nm<sup>3</sup>/day
- Liquid fertilizer production 3 MW
- Compost production 240 m<sup>3</sup>/day
- Compost production 15 t/day



## Time Schedule

- Basic engineering completed.
- Construction 2011/12.
- Commissioning 2012.
- Plant in commercial operation

## Renew Energy's involvement

- Basic Engineering Package
- Support during detailed engineering
- Supervision during construction
- Assistance during commissioning and testing
- Planning and execution of the startup of the digesters.
- 3 months operation support
- Service contract

# Renew Energy and Viaspace Reference St. Croix

## Project info

- 1500 acres of Giant King Grass fields
- 45 fulltime jobs
- provides 15% renewable energy to ST. croix
- “Green island” branding
- Total investment of 50 mio USD

## Technical data

Giant King Grass	530 s-ton/day
Biogas	2000 scfm
Power	7 MW
Liquid fertilizer	630 s-ton/day
Compost	80 s-ton/day

## Time Schedule

- 25 acre Giant King Grass test field planted
- Phase 1 of Basic engineering completed.
- Phase 2 of Basic engineering in progress.
- Basic engineering finalised 1Q-13. Construction start 3Q-13, commercial operation 2Q-15.



## Renew Energy's involvement

- Project development support
- Basic Engineering Package (Completed and delivered)
- Support during detailed engineering
- Supervision during construction
- Assistance during commissioning and testing
- Planning and execution of the startup of the digesters.
- 3 months operation support
- Service contract

If you think...

# Energy Crops

...think...



If you think...

# Biogas

...think...

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# Thank you for your attention



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