BEET ENERGY

MENDOTA ADVANCED BIOENERGY
BEET COOPERATIVE

European Union Delegation
November 14-21, 2010

Delegation hosted by:

KWS

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GOALS

- Sustainable producer of
  - Advanced biofuels,
  - Green-e electricity,
  - Biomethane as compressed natural gas (CNG)
  - Agricultural fertilizer products
  - Reclaimed water for crop/landscape use
- Highly integrated biorefinery using technology and resources developed from around the world
- Valued contributor to local economy

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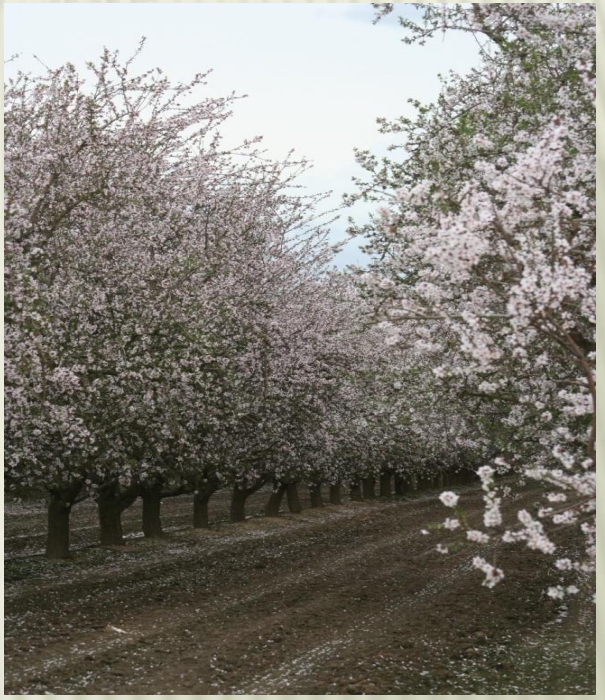
BIOREFINERY SUBSYSTEMS

- Biomass gasifier
- Advanced ethanol plant
- Anaerobic digester
- Water treatment plant



- Expected employment
  - 40-50 full time in biorefinery
  - Plus 40-50 harvest, trucking & support

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PROJECT DEVELOPMENT TEAM

Biorefinery Owner	
John Diener	Board President
Sharon Starcher	Board Administrative Coordinator
Arnold Daglia P.E..	Project Engineering Advisor
Leon Woods	Regulatory Affairs
Joe Marchini	Counsel of Baker, Manock & Jensen

Project Developer	
Jeff Manternach	CFO
Jim Moore P.E.	Project Director

Applied Biofuels Research	
Dr. Ruihong Zhang	Biogas/Ethanol Production
Dr. Steve Kaffka	Sugar Beet/Biomass/Water

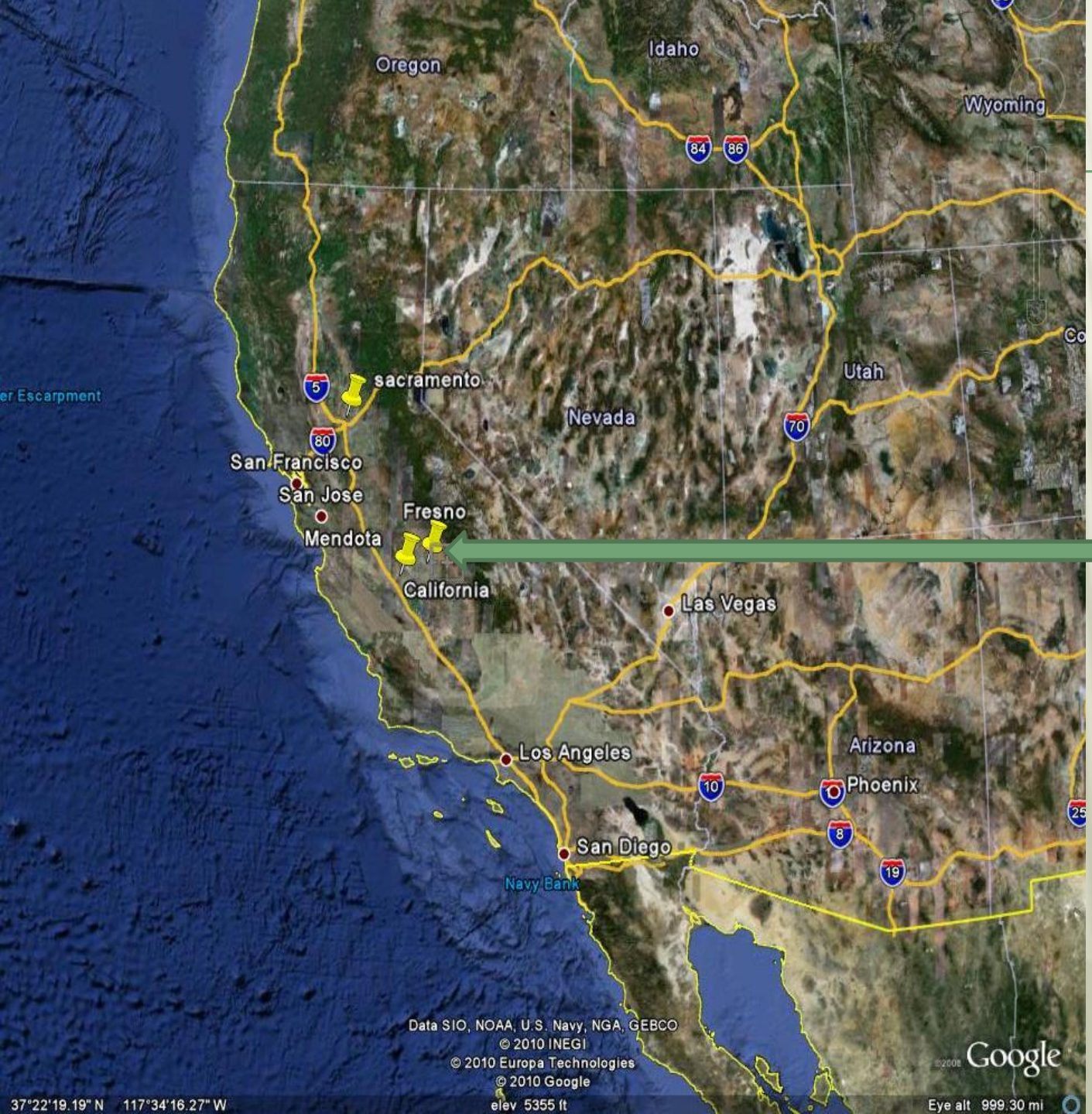
Project Management Liaison	
Dr. David Zoldoski	Director, ICWT
Jim Tischer	Project Coordinator

Local, State, Federal Incentives	
Shawn Garvey	CEO

Energy Product Sales	
Mike Jennings	CEO

Biomass Resource Evaluation	
Tad Mason	CEO

Develop Sugar Beet BMP Handbook	
Ladi Asgill	Program Manager

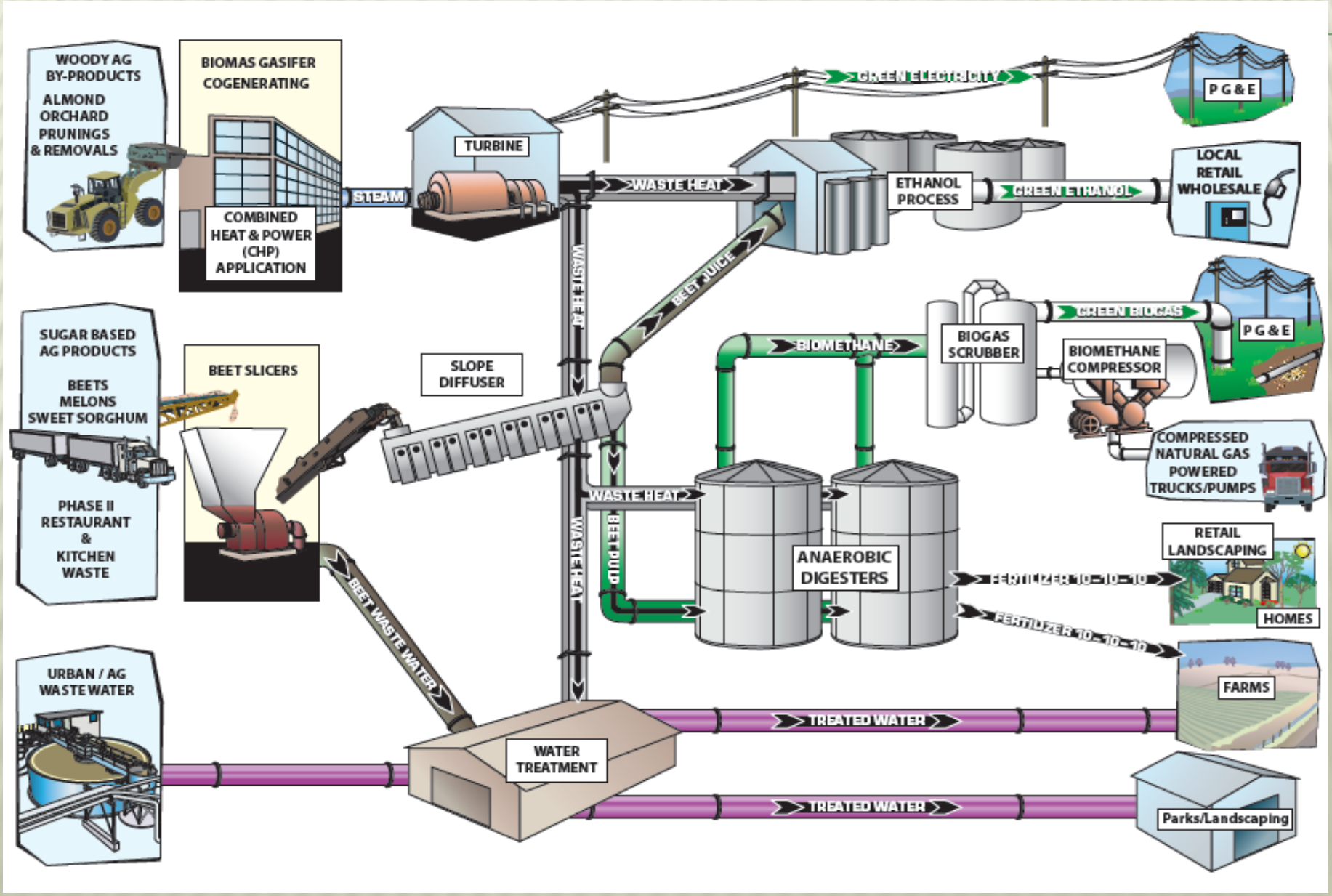


Mendota, California vicinity map

MENDOTA – FRESNO REGION

CleanTech America 5MW Solar Park (operational Jan10)
Covanta 25MW Biomass Plant
Mendota Biorefinery Site
W Belmont Ave
Guillan Park Dr
© 2010 Europa Technologies
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2010 Google
Google
36°45'14.60" N 120°21'34.68" W
elev 163 ft
Sep 25, 2009
Eye alt 5420 ft

BIOREFINERY PROCESS (SCHEMATIC)



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MAJOR BIOREFINERY PRODUCTION

Major Equipment Systems	Equipment Capacities U.S.	Annual Production U.S.	Equipment Capacities Metric	Annual Production Metric
Gasifier/Turbine	120K lbs/hr @ 750°F	6.3 MW	54,500Kg @ 400 C	6.3 MW
SB to Ethanol Plant	30 MM Gal/Yr nameplate	33,490,279 Gal/Yr		127,000,000 Liters 126,760 M^3
Anaerobic Digester	1,470 T/Day	537,000 T/Yr	1,338 Tonnes/Day	488,670 Tonnes
Biomethane	4,900 SCF/Day	1.6 MM/MCF/Yr	138.7 M^3/day	45,280 M^3
MAJOR LOCAL FEED STOCKS				
Sugar Beets - 40 mi (65 km)		840,000 T/Yr		764,400 Tonnes
Prunings – 50 mi. (81 Km)		50,000 BDT/Yr		45,500 BD Tonnes/Yr
Grain, melons, rice straw, manure, etc.		30,000 T/Yr		27,300 Tonnes/Yr
Regional Grain as needed		148,000 T/Yr		134,680 Tonnes/Yr
WATER BALANCE				
City of Mendota WWT Plant	+1.0 MGD (694 gpm)	+1,050 Ac-Ft/Yr	3,785 M^3/Day (2,627 Liters/min)	1,295,154 M^3/Yr
Biorefinery Water Requirements	-1.3 MGD (920 gpm)	-1,341 Ac-Ft/Yr	4,920 M^3/Day (3,416 Liters/min)	1,654,096 M^3/Yr
Biorefinery Waste Water, Treated	+ .65 MGD (450 gpm)	+656 Ac-Ft/Yr	2,460 M^3/Day (1,708 Liters/min)	809,162 M^3/Yr
NET		**+365 Ac-Ft/Yr**		**450,220 M^3/Yr**

UC DAVIS RESEARCH

Sugar Beets on Research Farm

Pilot Bio-Digester Facility

UC DAVIS
UNIVERSITY OF CALIFORNIA

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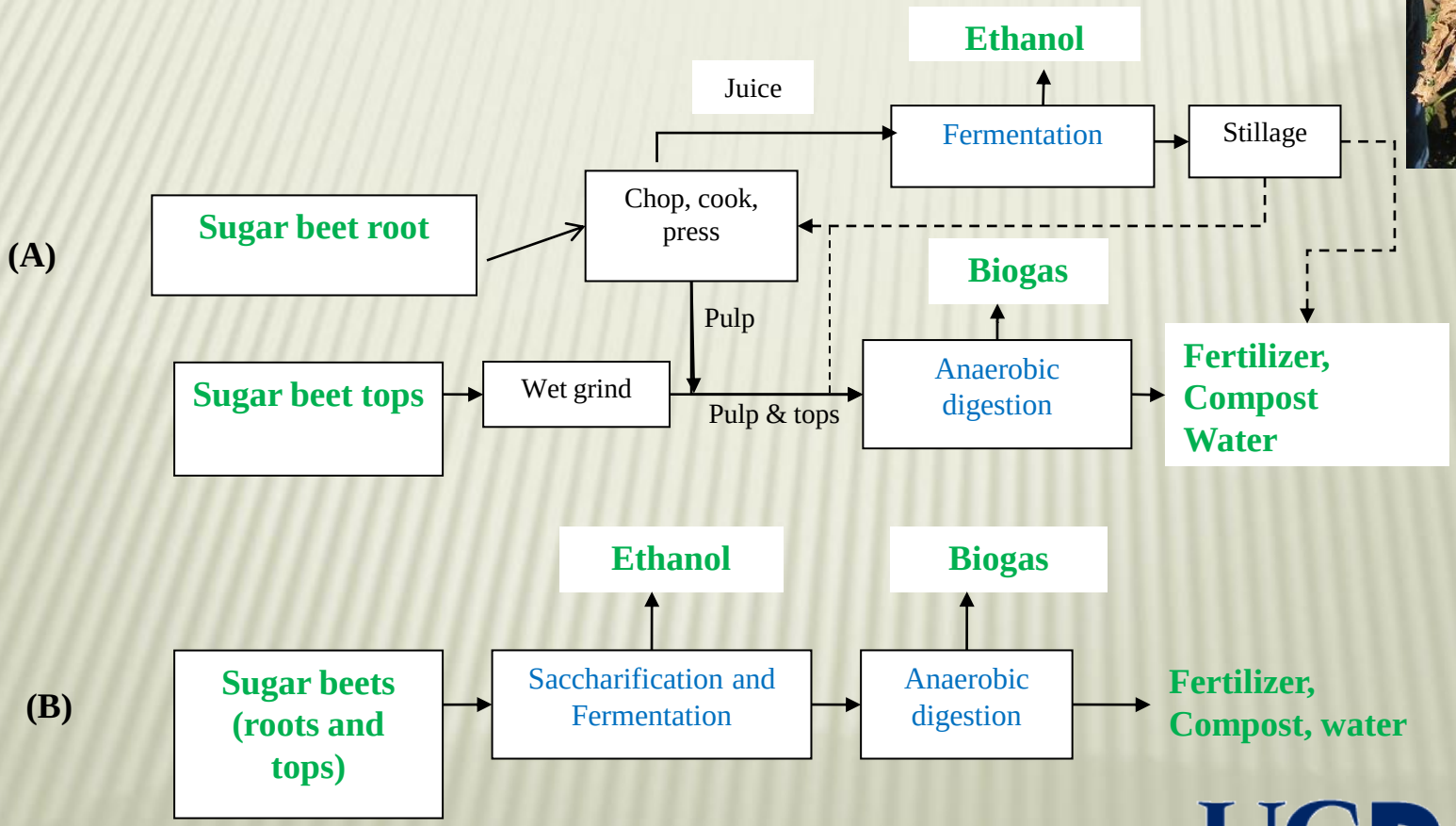
BEET CONVERSION PATHWAYS



UC DAVIS
UNIVERSITY OF CALIFORNIA

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PILOT FACILITY TESTING

- Existing Facility for Anaerobic Digestion
  - whole beets, beet tops and pulp
- Modified facility for ethanol fermentation
  - Beet fractionation equipment (juice and pulp separation)
  - Ethanol recovery equipment

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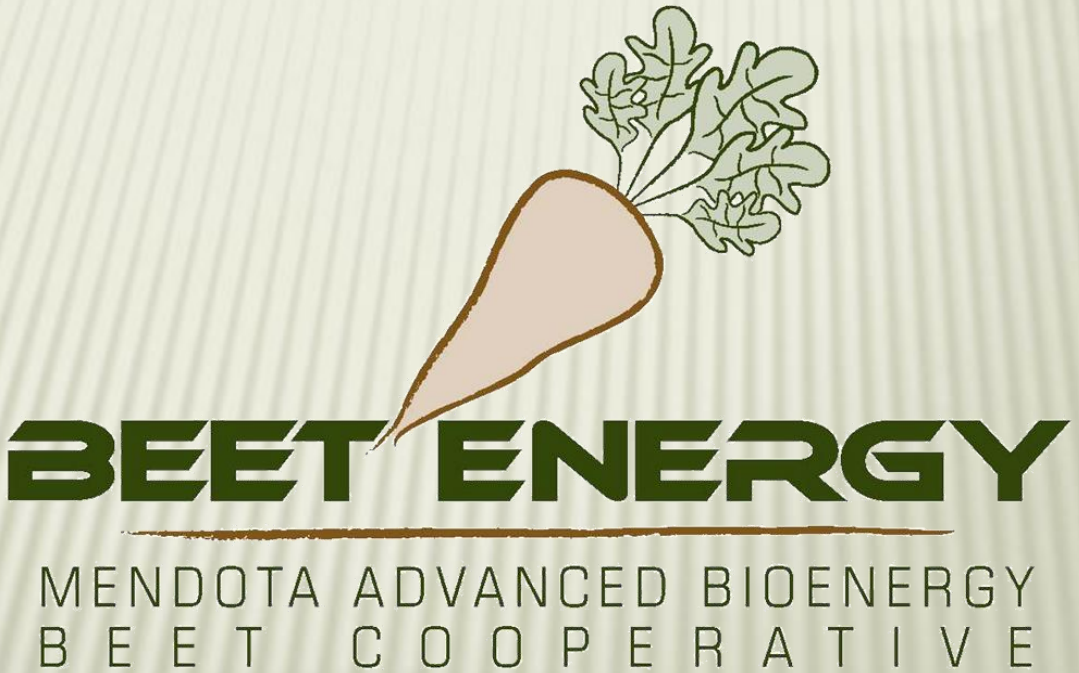
EUROPEAN UNION DELEGATION PARTICIPANT CONTACT INFORMATION

Name	Mendota Coop Role	Employer	Email address
John Diener	Mendota Coop. President	Red Rock Ranch	redrock.ranch@yahoo.com
Rusty Gragnani	Coop. Vice President	Gragnani Farms	rusty@gragnanifarms.com
Bill Pucheu	Coop. Member	Pucheu Bros. Ranch	pbrincwp@kermantel.net
Francis del Testa	Coop. Member	Del Testa Farms	Fdeltesta@aol.com
Jim Moore P.E.	Biorefinery Developer	IR1 Group LLC	jmoore@ir1group.com
Shawn Garvey	Coop. Fund Developer	The Grant Farm	shawn@thegrantfarm.com
Jim Tischer	Project Coordinator	Cal State Fresno	jtischer@csufresno.edu
Dr. Ruihong Zhang	Project Partner	UC Davis	rhzhang@ucdavis.edu
Dr. Steve Kaffka	Project Advisor	UC Davis	srkaffka@ucdavis.edu
Seyed Sadredin	Executive Director/ Air Pollution Control Officer	San Joaquin Valley Air Pollution Control District	Seyed.Sadredin@valleyair.org

QUESTIONS?



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