(1) Location	(2) Nature of Location	(3) BP1-BP2 Activities (Thru Mod 0009)	(4) BP3-BP5 Activities (Mod 0010)	(5) Land Administration
(PRIME)				
American Institute of				
Chemical Engineers,		(HQ) Project administration for all sub-tasks in SOPO and	(HQ) Project administration for all sub-tasks in SOPO	
120 Wall Street 23rd Fl.,	Commerical office	other management activities including technical education	and other management activities including technical	
New York, NY 10005	space	and workforce development program	education and workforce development program	Private
		7.107		
		Task 8.7	Task 8.7 Continuing partner and activities that started in	
		Activities include electrochemical separation of metal from scrap using ionic liquids. Materials will be characterized	BP2. Activities include electrochemical separation of metal from scrap using ionic liquids. Materials will be	
The University of Alabama		using XRD, SEM, TEM and wet chemical methods. The work	characterized using XRD, SEM, TEM and wet chemical	
Dept. Met. & Matls Eng.,		will be carried out untilizing the facilities and infrstrucural	methods. The work will be carried out untilizing the	
NERC Building Tuscaloosa,	Dedicated University	support housed in the NERC Research Building at the	facilities and infrstrucural support housed in the NERC	
AL35487	Laboratory Facility	University of Alabama.	Research Building at the University of Alabama.	State, University Campus
71235107	zazoratory raemey	onversity or rudbania.	nescuren sumanig at the sinversity of vitabania.	state, omversity campus
		Task 8.4	Tasks 8.4 and 8.8 (excluding task 8.8.11). Activities are	
		Only intellectual, academic, and analytical activities (no	only intellectual, academic, and analytical activities (no	
Apache		location needed)	location needed)	
			Task 3.2.4 . Continuing partner that started in BP2 and	
		Task 3.2.4	has been a project partner since. BP3-BP5 Activities	
University of Arizona WEST		Activities would include desing, development, pilot-testing	would include desing, development, pilot-testing of a	
Center2959 W. Calle Agua	University Laboratory	of a membrane-based process intensification face-to-face	membrane-based process intensification face-to-face	WEST Center – State
NuevaTucson, AZ 85745	Facility	short course.	short course.	property
Auburn University, Department of Chemical Engineering, 212 Ross Hall, Auburn, AL 36849 Clemson University Earle Hall 206 S. Palmetto	University campus Dedicated University Ruilding for Teaching and	Task 8.4 Data/model development and analysis, process simulation/optimization studies, analytical evaluations, proof of concept verifications, feasibility estimations, and document preparation Task 9.3 Data/model development and analysis, process simulation/optimization studies, and document preparation Task 10.6 Data/model development and analysis, process simulation/optimization studies, and document preparation, analytical and thermodynamic analyses of catalyst samples and their vapor-liquid equilibrium working enviconments for feasibility purposes. Task 2.7 Activities will include the development of mathematical models for chemical processes, computer code for simulating and optimizing these models, and disceptination.	Task 10.6 Data/model development and analysis, process simulation/optimization studies, and document preparation, analytical and thermodynamic analyses of catalyst samples and their vapor-liquid equilibrium working enviconments for feasibility purposes. Task 2.7. Continuing partner that started in BP2. Activities will include the development of mathematical models for chemical processes, computer code for simulating and optimizing these models, and	State of Alabama (land- grant university)
Hall 206 S. Palmetto	Building for Teaching and	simulating and optimizing these models, and dissemination	dissemination activities (preparing papers, reports,	
BlvdClemson, SC	Research	activities (preparing papers, reports, presentations, etc.)	presentations, etc.)	State
	ĺ	Task 5.7	Task 5.7: Continuing partner that started in BP2.	
Compact Membrane	ĺ	Activities will include fabrication and analysis of a	Activities will include fabrication and analysis of a	
Systems (CMS) 5.7335		membrane devices including small discs, modules, and	membrane devices including small discs, modules, and	l
Water StNewport DE 19083	Industrial, Dedicated	testing rigs	testing rigs	private
Carnegie Mellon University	ĺ	L	L	
Doherty Hall5000 Forbes		Task 9.4	Task 9.4. Continuing partner that started in BP2.	
Avenue Pittsburgh, PA 15213	University campus, Pittsburgh, PA	Optimization, software development, data analysis, modeling, and document preparation	Activies include optimization, software development, data analysis, modeling, and document preparation	Private

	7			
University of				
Delaware 250M			Task 8.1	
ISEB Newark,	Dedicated University	Task 8.1	Continuing partner that started in BP1 and has been a	
Delaware	Research and	(FA) Leader for Focus Area - Intensified Process	project partner since. Only intellectual, academic, and	
19716	Development Facility	Fundamentals	analytical activities (no location needed)	University
			Task 6.5, 7.6, 8.3, and 9.5	
			Continuing partner that started in BP2 and has been a	
		Task 6.5	project partner sinceTask 6.5	
		Activities will include the development computational	Activities will include the development computational	
		models to predict thermodynamic and reactivity properties		
		of oxides	properties of oxides	
		Task 7.6	Task 7.6	
		Activities will include design fabrication and testing of	Activities will include design fabrication and testing of	
		microreactors for laboratory scale bio-paraxylene	microreactors for laboratory scale bio-paraxylene	
		production from biomass glucose. Task 8.3	production from biomass glucose. Task 8.3	
		Activities will include design fabrication and testing of	Activities will include design fabrication and testing of	
		microreactors for laboratory scale bio-paraxylene	microreactors for laboratory scale bio-paraxylene	
University of Delaware 355		production from biomass glucose.	production from biomass glucose.	
ISE Laboratory 221		Task 9.5	Task 9.5	
Academy Street Newark,	Dedicated University			
DE 19716	Laboratory Facility	Software, database, mechanism building, and testing as outlined in the proposal.	Software, database, mechanism building, and testing as outlined in the proposal.	University of Delaware
DE 19710	Laboratory Facility	outilied in the proposal.	outililed in the proposal.	Offiversity of Delaware
University of Delaware 150		Task 6.5	Task 6.5: Continuing partner that started in BP2 and	
Academy Street, Colburn		Activities will include fabrication and evaluation of chemical		
Laboratory, Newark, DE	Dedicated University	looping reactors for methane, ethane and propane	include fabrication and evaluation of chemical looping	
19716	Laboratory Facility	upgrade.	reactors for methane, ethane and propane upgrade.	University of Delaware
13710	Edition y Facility	ардинис.	Task 7.7	Oniversity of Belaware
			Continuing partner that started in BP2 and has been a	
University of Delaware			project partner since - BP3-BP5 activites include	
Ogunnaike Laboratory 269	Dedicated University	Task 7.7	Calculations and simulations of reactive distillation	
CLB Newark, DE 19716	Computer Laboratory	Calculations and simulations of reactive distillation column.	column.	State of Delaware
Dow Chemical The Dow	, , , , , , , , , , , , , , , , , , , ,			
DiamondCenter, 270	Corporate building with		Task 5.4 Continuing partner that started in BP2 and has	
AbnerJackson Parkway,		Task 5.4	been a project partner since. BP3-BP5	
Texas 288 Frontage Road,	for industry partner of the	Activities will include data analysis, processsimulation and	Activities will include data analysis, processsimulation	
Lake Jackson, TX 77566	project	validation of theoretical results	and validation of theoretical results	Privately owned.
			Task 5.7 (exluding Task 5.7.4, 5.7.8 & 5.7.14), 6.5, 9.3,	
			9.4, and 9.5	
			Continuing partner that started in BP2 and has been a	
			project partner since - BP3-BP5 activities are Consulting,	
	Existing Research Facilities	Task 5.7, 6.5, 9.3, 9.4, and 9.5	data analysis, modeling, and document preparation. A	
The Dow Chemical	in Dow Texas Operations	Consulting, data analysis, modeling, and document	separate EQ1 will be submitted for any field work in	
Company Freeport, TX	Facility (Industrial Complex)	preparation	project 5.7	Private
	Existing Research Facilities		Task 6.5, 9.3, 9.4, and 9.5	
	in Dow Michigan	Task 6.5, 9.3, 9.4, and 9.5	Continuing partner that started in BP2 and has been a	
The Dow Chemical	Operations Facility	Consulting, data analysis, modeling, and document	project partner since - BP3-BP5 activities are Consulting,	
Company Midland, MI	(Industrial Complex)	preparation	data analysis, modeling, and document preparation.	Private
			Task 5.7 (exluding Task 5.7.8 & 5.7.14), 6.5, 9.3, 9.4,	
			and 9.5	
			Continuing partner that started in BP2 and has been a	
	Existing Research Facilities		project partner since - BP3-BP5 activities are Consulting,	
	in Dow	Task 5.7	data analysis, modeling, and document preparation. A	
The Dow Chemical	PlaquemineOperations	Consulting, data analysis, modeling, lab test, and document	separate EQ1 will be submitted for any field work in	
Company Plaquemine, LA	Facility (Industrial Complex)	preparation	project 5.7	Private
		·	Task 5.6: Continuing partner that started in BP2 and has	
		Task 5.6	been a project partner since - BP3-BP5 activities are	
		Task 5.6 Only intellectual, academic, and analytical activities (no	been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no	
EcoCatalytic LLC			Only intellectual, academic, and analytical activities (no location needed)	
•		Only intellectual, academic, and analytical activities (no location needed)	Only intellectual, academic, and analytical activities (no location needed) Task 5.5 and 8.5	
ExxonMobil's Research and		Only intellectual, academic, and analytical activities (no location needed) Task 5.5 and 8.5	Only intellectual, academic, and analytical activities (no location needed) Task 5.5 and 8.5 Continuing partner that started in BP2 and has been a	
ExxonMobil's Research and Engineering (EMRE)		Only intellectual, academic, and analytical activities (no location needed) Task 5.5 and 8.5 Activities will include modelling, optimization, fabrication,	Only intellectual, academic, and analytical activities (no location needed) Task 5.5 and 8.5 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include	
ExxonMobil's Research and		Only intellectual, academic, and analytical activities (no location needed) Task 5.5 and 8.5	Only intellectual, academic, and analytical activities (no location needed) Task 5.5 and 8.5 Continuing partner that started in BP2 and has been a	Private

	•		T	
			Task 7.5 : Continuing partner that started in BP2 and	
		Task 7.5	has been a project partner since - BP3-BP5 activities will	
FAST International 620		Activities will include development and fabrication of GO	include development and fabrication of GO membrane	
Boston St. LaPorte, IN	Company Laboratory	membrane modules using GO membranes developed at the	I :	
46350	Facility	Georgia Tech site.	Georgia Tech site.	City
Georgia				
Institute of			Task 9.1	
Technology 311			Continuing partner that started in BP1 and has been a	
Ferst Drive NW	Dedicated University		project partner since - BP3-BP5 activities are only	
Atlanta, GA	Research and	Task 9.1	intellectual, academic, and analytical (no location	
30332-0100	Development Facility	(FA) Leader for Focus Area - Modeling & Simulation	needed)	University
Georgia Institute of				
Technology Renewable			Task 7.5: Continuing partner that started in BP2 and	
Bioproducts Institute 500		Task 7.5	has been a project partner since. BP3-BP5 activities will	
10th St NW, Atlanta GA	Dedicated University	Activities will include development and testing of GO	include development and testing of GO membranes to	
30332	Laboratory Facility	membranes to concentrate black liquor feed streams.	concentrate black liquor feed streams	City
Georgia Institute of				
Technology School of			Task 9.6: Continuing partner that started in BP2 and	
Chemical & Biomolecular		Task 9.6	has been a project partner since - BP3-BP5 activities	
Engineering, 311 Ferst	Dedicated University	Lab-scale testing of porous adsorbents for gases, vapors	include Lab-scale testing of porous adsorbents for	
Drive, Atlanta, GA 30332	Laboratory Facility	and liquids	gases, vapors and liquids	State
Georgia Institute of				
Technology Systems				
Laboratory, Woodruff	Research Laboratory,the		Task 10.5: Continuing partner that started in BP2 and	
School of Mechanical	campus of theGeorgia	Task 10.5	has been a project partner since - BP3-BP5 activities	
Engineering 771 Ferst	Institute ofTechnology,	Laboratory-scale investigations of heat transfer	include laboratory-scale investigations of heat transfer	University System
Drive, Atlanta GA 30332	Atlanta GA	enhancement.	enhancement.	ofGeorgia
University of				
Houston S222				
Engineering				
Bldg 1 4726			Task 5.1	
Calhoun Rd	Dedicated University	Task 5.1	Continuing partner that started in BP1 and has been a	
Houston, TX	Research and	(FA) Leader for Focus Area- Chemical and Commodity	project partner since. Only intellectual, academic, and	
77204-4004	Development Facility	Processing	analytical activities (no location needed)	University
77204 4004	Development racinty	Troccssing	Task 10.5. Continuing partner that started in BP2 and	Oniversity
			has been a project partner since. BP3-BP5 activities	
		Task 10.5	include Research, laboratory work, data collection and	
	Research and Technology	Research, laboratory work, data collection and business	business office operations. Heat exchanger will be	
Heat Transfer Research, Inc.	Center, Laboratory and	office operations. Heat exchanger will be operated	operated attemperatures, pressures and flowrates to be	
(HTRI) 165 Research Drive	BusinessOffice	attemperatures, pressures and flowrates to be determined	determined with single component and binary process	
Navasota, TX 77868	activities,Navasota TX	with single component and binary process fluids.	fluids.	Private
INAVASULA, IA 77000	activities, Navasota 1A	with single component and binary process noids.	Task 8.7: Continuing partner that started in BP2 and	riivate
			has been a project partner since - BP3-BP5 Activities will	
		Task 8.7	be performed using existing small scale experimental	
			equipment. Electrochemical cell testing will be	
Idaho National Laboratory		Activities will be performed using existing small scale experimental equipment. Electrochemical cell testing will	performed at a small scale (100 mL or less) to minimize	
,			l' '	
Energy Innovation	Dodicated laborates:	be performed at a small scale (100 mL or less) to minimize	cost and materials usage. Other activities will involve	
Laboratory775 University Blvd. Idaho Falls, ID 83401	Dedicated laboratory facility (leased)	cost and materials usage. Other activities will involve	system modeling involving existing computer capabilities.	DOE, leaseholder
DIVU. IUdiio Falis, ID 83401	racincy (reaseu)	system modeling involving existing computer capabilities. Task 8.4	capavilices.	DOE, leaseriolder
	ĺ		Tack 8.4 and 10.6	
Introduciona Inc. 200		Activities will include production and characterization of	Task 8.4 and 10.6	
IntraMicron, Inc. 368	File on Boards outland For 1991	micro-diameter metal fiber.	Continuing partner that started in BP2 and has been a	
Industry Drive, Auburn, AL	Fiber Production Facility,	Task 10.6	project partner since - New BP3-BP5 activities are the	Delegate
36832	Laboratory, and Office	OSR lab experiments and data analysis	same type and scale as previously reviewed activities.	Private
			L	
			Task 8.4 and 10.6	
			Continuing partner that started in BP2 and has been a	
			= :	
			project partner since - New BP3-BP5 activities: Task 8.4	
		Task 8.4	project partner since - New BP3-BP5 activities: Task 8.4 Activities will include the production of microfibrous	
		Activities will include the production of microfibrous media	project partner since - New BP3-BP5 activities: Task 8.4 Activities will include the production of microfibrous media (wet-laid sheet formation, sintering) and the	
		Activities will include the production of microfibrous media (wet-laid sheet formation, sintering) and the loading of	project partner since - New BP3-BP5 activities: Task 8.4 Activities will include the production of microfibrous media (wet-laid sheet formation, sintering) and the loading of microfibrous entrapped sorbent (MFES)	
IntraMicron, Inc. 354		Activities will include the production of microfibrous media (wet-laid sheet formation, sintering) and the loading of microfibrous entrapped sorbent (MFES) reactors.	project partner since - New BP3-BP5 activities: Task 8.4 Activities will include the production of microfibrous media (wet-laid sheet formation, sintering) and the loading of microfibrous entrapped sorbent (MFES) reactors.	
IntraMicron, Inc. 354 Industry Drive, Auburn, AL 36832	MFEC Manufacturing and Reactor Loading Facility	Activities will include the production of microfibrous media (wet-laid sheet formation, sintering) and the loading of	project partner since - New BP3-BP5 activities: Task 8.4 Activities will include the production of microfibrous media (wet-laid sheet formation, sintering) and the loading of microfibrous entrapped sorbent (MFES)	Private

Tak 1.0.6 Collection of OSR performance data with perhaps a bit data Country, Treas Oscillation of OSR performance data with perhaps a bit data Collection of		Г		Income and the second s	
Delicated University State University St	IntraMicron, Inc.		L	TASK 10.6 Continuing partner that started in BP2 and	
Final 1,0 General 29214 0.5 °FM, Plot OSR T&E site Tak 1,0.6 So Collection of OSR performance data with perhaps a bit data of the property of the collection of OSR performance data with perhaps a bit data of the property of the collection of OSR performance data with perhaps a bit data of the property of the collection of OSR performance data with perhaps a bit data of the property of the collection of OSR performance data with perhaps a bit data of the property of the collection of OSR performance data with perhaps a bit data analysis. Tak 7.1 Contriving partner that started in BP1 and has been a project partner since. Only intellectual, academic, and project partner since. Only intellectual, academic, and project partner since. Only intellectual, academic, and project partner since. BP3 BP3 activities are Pilot of the property of	•				
Fax 1.0.6 Continuing partner that started in RP2 and has been an project partner since. RP3 aPPS activities will be performance data with perhaps a bit data continuing partner that started in RP2 and has been an project partner since. RP3 aPPS activities will be partner since. RP3 aPPS activities are into the activities of the proposed system will also be conducted an adjustance of the start	99°28'01.8"W Dimmit		Collection of OSR performance data with perhaps a bit data	Collection of OSR performance data with perhaps a bit	
Final State 1. Continuing partner from the started in RP1 and has been a project partner since. AP3 AP5 activities obligation of SR performance data with gerhaps a bit data analysis. Task 7.1 Contrive Troas Dedicated University Biodiffer of Partners of P	County, Texas	Pilot OSR T&E site	analysis.		Private
Collection of OSR performance data with perhaps a bit data Collection of OSR performance data with perhaps a bit data county from the control of the control				9.1	
Does State University Control (1997) Does State University Does St	SourGas 28°21'40.5"N,		Task 10.6	has been a project partner since -BP3-BP5 activities -	
Task 7.1 Task 7.2 Task 7.2 Task 7.3 Task 7.3 Task 7.4 Task 7.3 Task 7.4 Task 7.5 Task 7.5 Task 7.5 Task 7.6 Task 7.7 Task 7.7 Task 7.7 Task 7.8 Task 7	99°28'01.8"W Dimmit		Collection of OSR performance data with perhaps a bit data	Collection of OSR performance data with perhaps a bit	
James Hard Hard Hard Hard Hard Hard Hard Hard	County, Texas	Pilot OSR T&E site	analysis.	data analysis.	Private
Since Market Sale Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and smarkfull activities (on location needed) Well State University Bedicated University Development Facility Owa State University Back 7.4 Task 7.4 Initial physical and chemical characterization of the feedback, including alialization of purplysic products. Task 7.4 Initial physical and chemical characterization of the feedback, including alialization of the feedback, including alialization of purplysic products. Task 7.5 A christien will include acquisition of reaction kinetics for a self-decided University A proposed system will also be conducted at this site. Developing designs of demonstration-scale mondules for previously tested unit operations in collaboration with sisting. Developing designs of demonstration-reaction reaction science and aliaboratory scale continuous subharifient strippini and filtration; and modeling in the proposed system will also be conducted at this site. Task 7.5 Task 7.6 Task 7.5 Task 7.5 Task 7.5 Task 7.6 Task 7.5	Iowa State				
Since Market Sale Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and smarkfull activities (on location needed) Well State University Bedicated University Development Facility Owa State University Back 7.4 Task 7.4 Initial physical and chemical characterization of the feedback, including alialization of purplysic products. Task 7.4 Initial physical and chemical characterization of the feedback, including alialization of the feedback, including alialization of purplysic products. Task 7.5 A christien will include acquisition of reaction kinetics for a self-decided University A proposed system will also be conducted at this site. Developing designs of demonstration-scale mondules for previously tested unit operations in collaboration with sisting. Developing designs of demonstration-reaction reaction science and aliaboratory scale continuous subharifient strippini and filtration; and modeling in the proposed system will also be conducted at this site. Task 7.5 Task 7.6 Task 7.5 Task 7.5 Task 7.5 Task 7.6 Task 7.5	University				
aboratory ablating 517 are Research and Pevelopment Facility Beceletand Pask 7.4 Task 7.5 Task 7.5 Task 7.6 Task 7.7 Task 7.6 Task 7.7 Task 7.6 Task 7.7 Task 7.6 Task 7.6 Task 7.7 Task 7.6 Task 7.7 Task	1140E				
aboratory ablating 517 are Research and Pevelopment Facility Beceletand Pask 7.4 Task 7.5 Task 7.5 Task 7.6 Task 7.7 Task 7.6 Task 7.7 Task 7.6 Task 7.7 Task 7.6 Task 7.6 Task 7.7 Task 7.6 Task 7.7 Task	Biorenewables			Task 7.1	
Task 7.4 Powelopment Facility Powelopmen		Dedicated University			
Development Facility Task 7.4 Task 7.5 Task 8.7 Task		· · · · · · · · · · · · · · · · · · ·	Task 7.1	0.	
Task 7.4 Total Corporation Pilot Facility Task 7.5 Total Corporation Pilot Facility Task 7.6 Total Company Office, Workshop Total Corporation Pilot Facility Task 7.6 Total Company Office, Workshop Total Company Offic	-				I la ir ra anita r
Task 7.4 Positive strips	BISSEII KOAU	Development Facility	(FA) Leader for Focus Area - Reflewable Bioproducts		University
Task 7.4 Task 7.4 Initial physical and chemical characterization of the feedstock, including alkalic content to determine required products. Developing designs of demonstration scale modules for products under this site. Task 7.4 Initial physical and chemical characterization of the feedstock, including alkalic content to determine required products. Chemical characterization of provise products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for provisually tested unit operations in collaboration with subrecipient Easy Energy Systems. Techno-economic analysis of the proposed system will also be conducted at this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of alboratory-scale continuous this-film strippinf and filtration; and modeling laboratory 200 keembrane Specialists ILC2 (company Office, Workshop) and Warehousing Task 5.8 Task 7.5 Engineering support activities will be performed withessting equipment. Product haracterization will be carried out using the optical microscope and mechanical testing of continuous parterisated in P31 and has been a project partner since - 8P3-8P3-8P5-8P5-8P3-8P5-8P3-8P3-8P3-8P3-8P3-8P3-8P3-8P3-8P3-8P3					
Dedicated University mova State University				0.	
dilute suffur acid. Pilot testing of autothermal pyrolysis of perterated biomass. Task 7.4 Initial physical and chemical characterization of the feedstock, including alkalic content to determine required products. Chemical characterization of promotes the feedstock, including alkalic content to determine required products. Chemical characterization of promotes and products and as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for proviously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic analysis of the products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for proviously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic analysis of the products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for proviously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic analysis of the proposed system will also be conducted at this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavation reactors; evaluation of continuou			7.7		
Fask 7.4 Initial physical and chemical characterization of the feedstock, including alkali content to determine required products such as ash, moisture, and sugar content in ligal products such as ash, moisture, and sugar content in ligal products such as ash, moisture, and sugar content in ligal products such as ash, moisture, and sugar content in ligal products and the submitted products such as ash, moisture, and sugar content in ligal products. Developing designs of demonstrations in collaboration with submitted and products and products such as ash, moisture, and sugar content in ligal products. Developing designs of demonstrations in collaboration with submitted in the proposed system will also be conducted at a this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant themistries, operation of laboratory scale continuous subdarian and evaluation reactors; evaluation of continuous studies and and evaluation reactors; evaluation of continuous studies and advistoring reactors; evaluation of continuous studies and activation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and water of the proposed system will also be conducted at this size. Task 7.5 Company Office, Workshop and Warehousing Task 7.5 Company Office, Workshop and Warehousing Task 8.7 Engineering support activities will be performed witheristing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will		· · · · · · · · · · · · · · · · · · ·	_ :	,	
Task 7.4 Initial physical and chemical characterization of the feedstock, including alkali content to determine required pretreatment levels. Chemical characterization of phyolysis products such as ash, mosture, and sugar content in legid products. The products such as ash, mosture, and sugar content in legid products. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with subrecipient asy fence year. The received analysis of the proposed system will also be conducted at this site. Dedicated University News Associated Universi	1327 U Avenue Boone, IA	Research and Development			
Task 7.4 Initial physical and chemical characterization of the feedstock, including alkalic content to determine required preference tevels. Chemical characterization of pyrohysis products such as a sh, moisture, and sugar content in liquid products. The products such as a sh, moisture, and sugar content in liquid products. The products such as sh, moisture, and sugar content in liquid products. The products such as sh, moisture, and sugar content in liquid products. The products such as sh, moisture, and sugar content in liquid products. The product of purposes of the proposed system will also be conducted at this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries, operation of aboratory-scale continuous bublar and edivation reactors; evaluation of continuous studies and warrance and warrance and continuous studies and warrance and warrance and continuous studies and warrance and the sites. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous studies and acquisition reactors; evaluation of continuous thin-film strippinf and filtration; and modeling aparter that stand in BP2 and has been a project partner since. P8-38P5 activities will be partner that stand in BP2 and has been a project partner since. P8-38P5 activities will be partner that stand in BP2 and has been a project partner since. P8-38P5 activities will be partner that stand in BP2 and has been a project partner since. Only visits to Georgia Tech site. Task 7.5 Company Office, Workshop and Warehousing the existing computer facilities for process modell	50036	Facility	pretreated biomass.	of pretreated biomass.	University
Task 7.4 initial physical and chemical characterization of the feedstock, including alkali content to determine required preferentment levels. Chemical characterization of products. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Task Perepry Systems. Techno-economic analysis of the proposed system will also be conducted at facility Task 5.8 Activities will include acquisition of reaction kinetics for a subdrated Corporation Pilot Plant Facilities 29400 Sheeding Besigns of demonstration of previously tested unit operations in collaboration with Subcregient Task S.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of aboratory-scale continuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation reactors; evaluation of continuous tubular and advisory input to project activities will aboratory 720/ West ML. King Blvd., Sulte OWEST ML. Kin				Task 7.4	
Task 7.4 initial physical and chemical characterization of the feedstock, including alkali content to determine required preferentment levels. Chemical characterization of products. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Task Perepry Systems. Techno-economic analysis of the proposed system will also be conducted at facility Task 5.8 Activities will include acquisition of reaction kinetics for a subdrated Corporation Pilot Plant Facilities 29400 Sheeding Besigns of demonstration of previously tested unit operations in collaboration with Subcregient Task S.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of aboratory-scale continuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation reactors; evaluation of continuous tubular and advisory input to project activities will aboratory 720/ West ML. King Blvd., Sulte OWEST ML. Kin				Continuing partner that started in BP1 and has been a	
initial physical and chemical characterization of the feedstock, including alkal content to determine required pretreatment levels. Chemical characterization of pyrolysis products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic Anneys. J. Society Ested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic Anneys for the proposed system will also be conducted at this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries, operation of aboratory-scale continuous tribular and cavitation; and modeling and Warehousing Activities will include acquisition of reaction kinetics for a set of dispersant chemistries, operation of suboratory-scale continuous tribular and cavitation; and modeling and Warehousing Task 7.5 Company Office, Workshop and Warehousing Activities will not be continuous tribular and advisory input to project activities via a fee existing golutions (assert of suboratory 200 Neet Laboratory 200 Ne			Task 7.4		
feedstock, including alkalic content to determine required pretreatment levels. Chemical characterization of pyrolysis products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Eaps Prepry Systems. Techno-economic Superations and Development analysis of the proposed system will also be conducted at this site. Dedicated University Research and Development analysis of the proposed system will also be conducted at this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of analysis of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of analysis of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of analysis of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of foreaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of a dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of analysis of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of analysis of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation of a section freaction kinetics for a set of dispersant chemistries; operation of laboratory scale continuous tubular and cavitation rea					
pretreatment levels. Chemical characterization of pyroploss products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic analysis of the proposed system will also be conducted at this site. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic analysis of the proposed system will also be conducted at this site. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic analysis of the proposed systems will also be conducted at this site. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic analysis of the proposed systems will also be conducted at this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries, operation of alboratory-scale acquisition of reaction kinetics for a set of dispersant hemistries, operation of alboratory-scale continuous tubular and cavitation reactors; evaluation of reaction for eaction indicates for a set of dispersant hemistries, operation of alboratory-scale continuous tubular and cavitation reactors; evaluation of reactions intentics for a set of dispersant hemistries, operation of alboratory-scale and the scale and project partner since - New 893-895 activities will include acquisition of reaction kinetics for a set of dispersant hemistries, operation of alboratory-scale and the scale and project partner since - New 893-895 activities will end to exceed the scale and project partner since on the scale and the scale and project activities will be acried out using the existing computer facilities for process optimization and lab to pilot scale test tran				i · ·	
products such as ash, moisture, and sugar content in liquid products. Developing designs of demonstration-scale modules for previously tested unit operations in collaboration with Subrecipient Easy Energy Systems. Techno-economic Subrecipient Easy Energy Systems Subrecipient Easy Energy Systems Subrecipient Easy Energy Systems Subrecipient Easy Energy Systems Subrecipient Easy Energy Subrecipient Easy Energy Subrecipient Easy Energy Subrecipi				_ · · · · · · · · · · · · · · · · · · ·	
owa State University allorenewables Research alboratory Dedicated University Dedicated University Armes, IA 50011-1098 Research and Development particles with proposed system will also be conducted at this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory scale continuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation; and modeling and make been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 7.5 Engineering support activities will be performed witheasting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product using the opt				l'	
Sidernewables Research alboratory and advisory input to project activities will be performed withersting equipment. Product characterization will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Other activities will be performed withersting equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out	I Ct-t I I I It				
Dedicated University Mesearch and Development facility Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation; and modeling and modeling. Task 7.5 Company Office, Workshop Task 8.7 Egineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the opti	•		l'andre de la company de la co		
Siz Bissell Rd Ames, IA 50011-1098 Dedicated University Ames and Development analysis of the proposed system will also be conducted at this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant themsirties; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of existing pilot scale laboratory facility Membrane Specialists LLC 2 Nowe Court, Hamilton, OH S015 Task 8.7.5 Company Office, Workshop and Warehousing Metecr Coating Solutions Research Laboratory 200 Nest ML. King Blvd, Sulte B					
Research and Development facility this site. Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous tin-film strippinf and filtration; and modeling and modeling Task 7.5 Company Office, Workshop Consultancy and advisory input to project activities via and Warehousing the evisiting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the evisiting computer facilities for process optimization and lab to pilot scale test transition design. Task 8.7 Equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optica	•				
Facility this site. Facility Task 5.8 Excluding pilot plant construction and operation tasks 5.8.14, 5.8.16, 5.8.18): Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Continuous thin-film strippinf and filtration; and modeling and Warehousing Task 7.5 Consultancy and advisory input to project activities via leconference, or by visits to Georgia Tech site. Task 8.7 Task 8.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via leleconference, or by visits to Georgia Tech site. Task 8.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 8.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 8.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 8.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 8.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 8.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 8.7 Continu					
Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous thiolar and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and modeling Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous thin-film strippinf and filtration; and modeling and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling Task 7.5 Task 8.7 Task 8	Ames, IA 50011-1098	Research and Development	analysis of the proposed system will also be conducted at	analysis of the proposed system will also be conducted	
Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and baroatory facility Existing pilot scale aboratory facility Existing pilot scale aboratory facility Task 7.5 Company Office, Workshop and Warehousing Task 7.5 Company Office, Workshop and Warehousing Task 8.7 Engineering support activities will be performed withexisting equipment. Other activities will be performed withexisting equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process optimization and lab to pilot scale test transition design. Task 6.1 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via at eleconference, or by visits to Georgia Tech site. Task 8.7 Engineering support activities will be performed withexisting equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process optimization and lab to pilot scale test transition design. Task 6.1 Task 6.1 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be performed withexisting equipment. Other activities will be carried out using the existing computer facilities for process optimization and lab to pilot scale test transition design. Task 6.1 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be performed withexisting equipment. Other activities will be carried out using the existing computer facilities for process optimization		Facility	this site.	at this site.	University
Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant continuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation; and modeling and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and modeling. Task 7.5: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be carried out using the optical microscope and mechanical testing equipment. Order activities will be carried out using the optical microscope and mechanical testing equipment. Order activities will be carried out using the optic				Task 5.8 (excluding pilot plant construction and	
Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of acquisition of reaction kinetics for a set of dispersant set of dispersa				operation tasks 5.8.14, 5.8.16, 5.8.18): Continuing	
Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of abboratory-scale continuous bullular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and Task 7.5: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 7.5 Task 8.7 Engineering support activities will be performed withexisting equipment. Orbar activities will be carried out using the optical microscope and mechanical testing equipment. Orbar activities will be carried out using the existing computer facilities for process optimization and lab to pilot scale test transition design. Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous chin-film strippinf and filtration; and modeling continuous thin-film strippinf and filtration; and modeling and modeling Task 7.5: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be carried out using the optical microscope and mechanical testing equipment. Orber activities will be carried out using the optical microscope and mechanical testing equipment. Orber activities will be carried out using the existing computer facilities for process optimization and lab to pilot scale test transition design. City Johnstoty of Michigan 3020 1.H. Dow Bullding Ann Dedicated University Research and Task 6.1 Continuing partner that started in BP1 and has been a project partner s				partner that started in BP2 and has been a project	
Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous bular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling			Task 5.8	partner since - New BP3-BP5 activities will include	
set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling continuous thin-film strippinf and filtration; and modeling and modeling and modeling include consultancy and advisory input to project activities via been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 7.5 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities vial be carried out using the expert since - BP3-BP5 activities include Consultancy and advisory input to project activities vial be carried in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities vial be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the existing computer facilities for process modelling, process optimiza			Activities will include acquisition of reaction kinetics for a	F [*]	
Alant Facilities 29400 Askeland Blvd Wickliffe, Dake and Blvd Wickling and Blvd Wickliffe, Dake	Lubrizal Corporation Pilot		T	I	
continuous thin-film strippinf and filtration; and modeling and continuous thin-film strippinf and filtration; and modeling and modeling and modeling and modeling and modeling and modeling Task 7.5: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 7.5 Company Office, Workshop and Warehousing teleconference, or by visits to Georgia Tech site. Task 8.7 Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Dedicated Laboratory Facility Dedicated University of Michigan 3020 Arbor, MI Research and Task 6.1 Continuous thin-film strippinf and filtration; and modeling and modeling partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. City of Hamilton Task 8.7: Cash 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the end project partner since out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition desig					
Dehio laboratory facility and modeling modeling Task 7.5: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. Task 8.7: Company Office, Workshop and Warehousing Task 8.7: Company Office, Workshop and Warehousing Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities via teleconference, or by visits to Georgia Tech site. City of Hamilton Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be		Evicting pilot scale			
Membrane Specialists LLC 2 Nowe Court,. Hamilton, OH Company Office, Workshop and Warehousing Task 7.5 Company Office, Workshop and Warehousing Task 7.5 Company Office, Workshop and Warehousing Task 8.7 Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Dedicated University of Michigan 3020 Al-H. Dow Saliding Ann Dedicated University Research and Task 6.1 Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and advisory input to project activities vial teleconference, or by visits to Georgia Tech site. City of Hamilton Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Consultancy and existing equipment. Product characterization will be carried out using the specific partner since - BP3-BP5 activities include Consultancy and existing equipment. Product characterization will be carried out using the price and mechanical testing equipment. Product characterization will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. City of Hamilton					
Membrane Specialists LLC 2 Rowe Court,. Hamilton, OH 45015 Company Office, Workshop and Warehousing Task 7.5 Company Office, Workshop and Warehousing Task 8.7 Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Dedicated University of Michigan 3020 Alth. Dow Saluding Ann Dedicated University of Research and Task 6.1 Task 6.1 City of Hamilton Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Task 6.1 City Task 6.1 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities sill be performed withexisting equipment. Product characterization will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Product char	UIIIU	Iduoratory Idellity	anu	_	
Membrane Specialists LLC 2 Rowe Court,, Hamilton, OH 45015 Company Office, Workshop and Warehousing Task 7.5 Company Office, Workshop and Warehousing Task 8.7 Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities of the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Dedicated University of Wichigan 3020 H.H. Dow Building Ann Performed Without the existing Ann Performed Without the existing the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. City Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and				= :	
Rowe Court, Hamilton, OH Company Office, Workshop and Warehousing Consultancy and advisory input to project activities via teleconference, or by visits to Georgia Tech site. City of Hamilton Task 8.7 Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Dedicated Laboratory Facility design. City Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. City Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and	L				
teleconference, or by visits to Georgia Tech site. Task 8.7 Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Dedicated University of Michigan 3020 H.H. Dow Bailding Ann Dedicated University Research and Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. City of Hamilton Task 8.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be c					
Task 8.7 Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Dedicated Laboratory Facility Jniversity of Michigan 3020 Jniversity of Michigan 3020 Jniversity of Michigan Ann Dedicated University Research and Task 6.1 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities include Engineering support activities will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. City	, , , , ,			_	
Task 8.7 Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical m	45015	and Warehousing	teleconference, or by visits to Georgia Tech site.	site.	City of Hamilton
Task 8.7 Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical m					
Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Product characterization will be carried out using the existing equipment. Product character				Task 8.7: Continuing partner that started in BP2 and	
Engineering support activities will be performed withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition modelling, process optimization and lab to pilot scale test transition design. City Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and			Task 8.7	has been a project partner since - BP3-BP5 activities	
withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Dedicated Laboratory Facility Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and		ı	1		
Actor Coating Solutions Research Laboratory 200 West M.L.King Blvd., Suite L000, Chattanooga, TN Dedicated Laboratory Jniversity of Wichigan 3020 H.H.Dow Building Ann Dedicated University Research and Research Laboratory 200 Rest M.L.King Blvd., Suite Lesting equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the optical microscope and t			Engineering support activities will be performed	Include Engineering support activities will be berformed	
Research Laboratory 200 West M.L.King Blvd., Suite Lough Chattanooga, TN Jordicated Laboratory Bedicated Laboratory Joriversity of Wichigan 3020 H.H. Dow Building Ann Dedicated University Research and Dedicated University Research and Research and Task 6.1 Lesting equipment. Other activities will be carried out using testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition modelling, process optimization and lab to pilot scale test transition design. City Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and					
West M.L.King Blvd., Suite 1000, Chattanooga, TN 207402 Jniversity of Michigan 3020 -I.H. Dow Building Ann Dedicated University Research and Dedicated University Research and Dedicated University Research and Task 6.1 Using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition modelling, process optimization and lab to pilot scale test transition design. City Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and	Metcer Coating Solutions		withexisting equipment. Product characterization will be	withexisting equipment. Product characterization will be	
1.000, Chattanooga, TN Pacility Process optimization and lab to pilot scale test transition modelling, process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pilot scale test transition design. City 1.000, Chattanooga, TN Facility Process optimization and lab to pil	Metcer Coating Solutions Research Laboratory 200		withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical	withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical	
Arbor, MI Research and Research	Research Laboratory 200		withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using	with existing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out	
University of Michigan 3020 H.H. Dow Task 6.1 Suilding Ann Dedicated University Arbor, MI Research and Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and	Research Laboratory 200 West M.L.King Blvd., Suite	Dedicated aboratory	withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling,	with existing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process	
Michigan 3020 H.H. Dow Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and	Research Laboratory 200 West M.L.King Blvd., Suite 1000, Chattanooga, TN		withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition	with existing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale	
H.H. Dow Task 6.1 Building Ann Dedicated University Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and	Research Laboratory 200 West M.L.King Blvd., Suite 1000, Chattanooga, TN 37402		withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition	with existing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale	City
Building Ann Dedicated University Arbor, MI Research and Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and	Research Laboratory 200 West M.L.King Blvd., Suite 1000, Chattanooga, TN 37402 University of		withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition	with existing equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale	City
Arbor, MI Research and Task 6.1 project partner since. Only intellectual, academic, and	Research Laboratory 200 West M.L.King Blvd., Suite 1000, Chattanooga, TN 37402 University of Michigan 3020		withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition	withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design.	City
	Research Laboratory 200 West M.L.King Blvd., Suite 1000, Chattanooga, TN 37402 University of Michigan 3020 H.H. Dow	Facility	withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition	withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Task 6.1	City
18109 Development Facility (FA) Leader for Focus Area- Natural Gas Upgrading analytical activities (no location needed) University	Research Laboratory 200 West M.L.King Blvd., Suite 1000, Chattanooga, TN 37402 University of Michigan 3020	Facility	withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition	withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Task 6.1	City
	Research Laboratory 200 West M.L.King Blvd., Suite 1000, Chattanooga, TN 37402 University of Michigan 3020 H.H. Dow Building Ann Arbor, MI	Facility Dedicated University	withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design.	withexisting equipment. Product characterization will be carried out using the optical microscope and mechanical testing equipment. Other activities will be carried out using the existing computer facilities for process modelling, process optimization and lab to pilot scale test transition design. Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and	City

				,
University of Michigan			Task 8.5: Continuing partner that started in BP2 and	
North Campus Research		Task 8.5	has been a project partner since - BP3-BP5 activities	
Complex (NCRC) 2800		Activities will include design, fabrication, x-ray/microscopy	will include design, fabrication, x-ray/microscopy based	
Plymouth Road, Ann Arbor,	University of Michigan	based characterization and testing of membrane/catalyst	characterization and testing of membrane/catalyst	
Michigan.	Campus	systems.	systems.	State
University of Minnesota				
CHARACTERIZATION			Task 5.5: Continuing partner that started in BP2 and has	
FACILITY 12 Shepherd		Task 5.5	been a project partner since . BP3-BP5 Activities will	
Labs100 Union St.	Dedicated University	Activities will include the characterization of membarnes	include the characterization of membarnes using x-ray	
S.E.Minneapolis, MN 55455	Laboratory Facility	using x-ray diffraction and electron microscopy.	diffraction and electron microscopy.	State, private
University of				
Minnesota 209 Kaufert			Task 7.1	
Laboratory	Dedicated University		Continuing partner that started in BP1 and has been a	
2004 Folwell	Research and	Task 7.1	project partner since. Only intellectual, academic, and	
Ave.	Development Facility	(FA) Leader for Focus Area - Renewable Bioproducts	analytical activities (no location needed)	University
			Toda F.F. Combination and another standard 1, 222	
			Task 5.5: Continuing partner that started in BP2 and	
			has been a project partner since. BP3-BP5 Activities will	
		Task 5.5	include fabrication and performance testing of zeolite	
		Activities will include fabrication and performance testing	membranes on porous ceramic supports. Hydrothermal	
		of zeolite membranes on porous ceramic supports.	synthesis will be performed in Parr autoclaves, with	
		Hydrothermal synthesis will be performed in Parr	typical volumes of 50-100cc, at temperatures of up to	
		autoclaves, with typical volumes of 50-100cc, at	180oC and autogeneous pressure. The authoclaves will	
University of Minnesota		temperatures of up to 180oC and autogeneous pressure.	be placed in ovens that are located inside walk-in	
DEPARTMENT OF		The authoclaves will be placed in ovens that are located	hoods. Membrane performance testing (permeation	
CHEMICAL ENGINEERING		inside walk-in hoods. Membrane performance testing	rate measurements) will be performed using an	
AND MATERIALS		(permeation rate measurements) will be performed using	atmospheric pressure permeation set up located inside	
SCIENCEAmundson Hall 440		an atmospheric pressure permeation set up located inside a	a hood. Typical flowrates of the mixture fed to the	
and 481421 Washington		hood. Typical flowrates of the mixture fed to the	membrane during testing are 100cc/min (STP) of	
Ave. SE, Minneapolis, MN	Dedicated University	membrane during testing are 100cc/min (STP) of He/xylene	He/xylene mixtures with xylene partial pressure of up to	
55455-0132	Laboratory Facility	mixtures with xylene partial pressure of up to 20kPa.	20kPa.	State, private
University of Minnesota	, , ,	, ,		,
Department of Chemical				
Engineering and Materials			Task 5.7: Continuing partner that started in BP2 and	
Science Amundson Hall 421			has been a project partner since - BP3-BP5 activities	
Washington Ave		Task 5.7	include computer simulations and mathematical	
SEMinneapolis MN 55455	Academic Institution	Computer simulations and mathematical analysis.	analysis.	State, private
DENTINICA POND WITE DO 100	/ teaderine institution	compact simulations and matricination analysis.	Task 7.7: Continuing partner that started in BP2 and	otate, private
		Task 7.7	has been a project partner since. BP3-BP5 Activities will	
University of Minnesota		Activities will include liquid phase catalysis experiments and		
Dauenhauer Laboratory		kinetic measurements. Liquids sampled from small reactors		
432 Amundson Hall 421		(<1 L) will be analyzed by chromatography. Catalyst	(<1 L) will be analyzed by chromatography. Catalyst	
Washington Ave. SE	Dedicated University	particles (<1 gram) will be analyzed via spectroscopy and	particles (<1 gram) will be analyzed via spectroscopy	
Minneapolis, MN 55455	Laboratory Facility	titration.	and titration.	State of Minnesota
iviiiiieapolis, iviiv 55455	Laboratory Facility	uu auvii.	and difation.	State of Millinesora
			Task 5.6: Continuing partner that started in BP2 and	
		Task 5.6	has been a project partner since. BP3-BP5 Activities will	
		Activities will include synthesis, chericterization, and	include synthesis, chericterization, and reaction testing	
North Carolina State				
University EB I911 Parners	DedicatedUniversityLaborat	reaction testing of redox catalyst for the oxidative dehydrogenation of ethane. Subtasks will also include	of redox catalyst for the oxidative dehydrogenation of ethane. Subtasks will also include reaction testing of	
	· ·		_	NCCII/Ctoto
WayRaleigh NC. 27606	ory Facility	reaction testing of enthylene oligomerization to liquid fuels.	enthylene oligomerization to liquid fuels. Task 5.6: Continuing partner that started in BP2 and	NCSU/State
North Carolina State		Task 5.6	9.	
University EB III911 Oval	Dodicated Injunctity		has been a project partner since. BP3-BP5 Activities will	
	DedicatedUniversityLaborat	Activities will include and the combustion of hydrocarbon	include and the combustion of hydrocarbon rich exaust	NCSU/State
Dr Dalaigh NC NC 27COC	on, Facility	rich availet gas in an enark ingintion angina		
Dr,Raleigh, NC NC 27606	ory Facility	rich exaust gas in an spark ingintion engine.	gas in an spark ingintion engine.	NC30/State
Dr,Raleigh, NC NC 27606	ory Facility	Task 6.7	gas in an spark ingintion engine.	NC30/3tate
Dr,Raleigh, NC NC 27606		Task 6.7 Activities will include microwave reactor design and testing		Nesoystate
	NETL research laboratory	Task 6.7 Activities will include microwave reactor design and testing at small scale. A bench scale demonstration will be	Continuing partner that started in BP2 and has been a	NCSO/State
Dr,Raleigh, NC NC 27606 NETL 3610 Collins Ferry Rd, Morgantown, WV 26505	NETL research laboratory	Task 6.7 Activities will include microwave reactor design and testing		Government Owned

Tak 1.0. Cost modelling, component design, material studies from the studies of consequent reasons to model and conducting component design, material studies from the studies of consequent reasons to model and conducting component design, material studies from the studies of consequent reasons to model and conducting component design, material studies from the studies will include developing cost models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of consequent reasons to models and conducting experimental validation of conducting experimental validation of consequent reasons to models					
Task 10.1 Fig. Leader for Focus Area - Module Manufacturing, Cost modelling, component design, material studies Fig. Leader for Focus Area - Module Manufacturing, Cost modelling, component design, material studies Fig. Leader for Focus Area - Module Manufacturing, Cost modelling, component design, material studies Fig. Leader for Focus Area - Module Manufacturing Cost modelling, component design, material studies Fig. Leader for Focus Area - Module Activities will include developing cost models Activities will include developing cost models Activities will include developing cost models Activities will include developing cost models and conducting experimental validation of consequent rearred return and long-term strategies for producing microfiber components and modules Fig. Fig.				Task 10.1, 10.4, 10.6, 8.4, and 8.6	
Task 10.1 Fig. 1 Leader for Facus Area - Module Manufacturing, Cost modelling, component design, material studies Cost modelling, component design, material studies Task 10.6 Activities will include developing cost models and-conducting experimental validation of consequent rear- term and long term strategies for producing microfibercomponents and modules Task 10.6 Task 10.6 Activities will include developing cost models and-conducting experimental validation of consequent rear- term and long term strategies for producing microfibercomponents and modules Task 1.6 Task 2.6 Activities will include developing cost models and conducting experimental validation of consequent rear- term and long term strategies for producing microfibercomponents and modules Task 2.6 Task 3.6 Task 3.0 Task 3.0					
Task 10.4 (Fix) Leader for Focus Area - Module Manufacturing, Cost modelling, component design, material studies Task 10.6 Activities will include developing cost models andomaturing experimental validation of consequent reaches the manufacturing experimental validation of consequent reaches the manufacturing post trade of the conducting experimental validation of consequent reaches the manufacturing post trade of the conducting experimental validation of consequent reaches the manufacturing institute of consequent reaches and modules. Task 1.6. Task 1.0.4 Task 2.6 Task 3.6 Task 3.6					
Fall Loader for Forous Area- Module Manufacturing, Cost modelling, component design, material studies Task 10.4 Cost modelling, component design, material studies Task 10.4 Cost modelling, component design, material studies Architecturing Cost models					
Marufacturing, Cost modelling, component design, material studies Task 10.4 Cost modelling, component design, material studies Task 10.5 Task 10.5 Task 10.5 Task 10.6				, ,	
material studies Task 10.6 Cost modelling, component design, material studies Task 10.6 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing experimental validation of consequent near-term and long-term strategies for producing experimental validation of consequent near-term and long-term strategies for producing experimental validation of consequent near-term and long-term strategies for producing experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 3.2.3 Construing institute developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 3.2.3 Construing experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 3.2.3 Construing experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 3.2.3 Construing experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 3.2.3 Construing experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 3.2.3 Construing experimental validation of consequent near-term and progress and modules Task 8.2.3 Construing experimental validation of consequent near-term and progress and produces the progress and modules Task 8.2.3 Construing partner that started in 8P2 and has been a project partner i					
Task 1.0.4 Cost modelling, component design, material studies Task 1.0.6 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing incorbifercomponents and modules Task 2.6 Task 2.6 Task 2.6 Task 2.6 Task 3.6 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing incorbifercomponents and modules Task 3.1 Task 3.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing incorbifercomponents and modules Task 3.1 Task 3.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing incorbifer components and modules Task 3.2 Task 3.4 Ta					
Cost modelling, component delign, marterial studies Task 1.0.6 Activities will include developing cost models and conducting experimental validation of consequent near- marked programs to the wind of the producing increditor modules Task 8.4 Conducting increditor modules Task 8.4 Conducting increditor promotion and long-term strategies for producing increditor promotion and modules Task 8.4 Conducting increditor developing cost models and conducting increditor components and modules Task 8.4 Conducting increditor term and long-term strategies for producing microfiber components and modules Task 8.4 Conducting increditor term and long-term strategies for producing microfiber components and modules Task 8.4 Task 8.5 Task 8.4 Task 8.5 Task 8.4 Task 8.5 Task 8.2.3 Continuing partner that started in RP2 and has been a project partner since. PSP-BPS activities are continuous tubular and conduction in exception producing microfiber components and modules Task 8.4 Task 8.6 Tas			material studies	Task 10.4	
Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfibercomponents and modules microfibercomponents and modules Task 8.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfibercomponents and modules Task 8.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfibercomponents and modules Task 8.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 8.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 8.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber			Task 10.4	Cost modelling, component design, material studies	
Activities will include developing cost models and andonucting experimental validation of consequent near-term and long-term strategies for producing microfibercomponents and modules Task 8.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules with the producting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules with the producting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules with the producting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules with the producting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules with the producting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies for producing microfiber components and modules and long-term strategies f			Cost modelling, component design, material studies	Task 10.6	
andconducting experimental validation of consequent near- term and long-term strategies for producing incrofiber components and modules fask 8.4 al. Activities will include developing cost models and Conducting experimental validation of consequent near- term and long-term strategies for producing incrofiber components and modules Task 8.4 al. Activities will include developing cost models and conducting experimental validation of consequent near- term and long-term strategies for producing microfiber components and modules Task 8.6 and testing of separator hardware technology. Proceedings for producing microfiber components and modules Task 8.6 and testing of separator hardware technology. Proceedings for producing microfiber components and modules Task 8.6 and testing of separator hardware technology. Proceedings for producing microfiber components and modules Task 8.6 and testing of separator hardware technology. Proceedings for producing microfiber components and modules Task 8.6 and testing of separator hardware technology. Proceedings for producing microfiber components and modules Task 8.6 and testing of separator hardware technology. Proceedings for producing microfiber components and modules Task 8.5 and testing in continuing participation for process. Proceedings and protect participation and protect participation. Proceedings for producing microfiber components and modules Task 8.5 and testing in laboratory. Proceedings for producing microfiber components and modules Task 8.5 and testing in laboratory sale protection for process. Proceedings for producing microfiber components and modules Task 8.5			Task 10.6	Activities will include developing cost models	
term and long-term strategies for producing incombine components and modules Task 8.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 8.4 Activities will include developing cost models and conducting experimental validation of consequent near-term and long-term strategies for producing microfiber components and modules Task 8.6 Task 8.6 Task 8.6 Development in development in a modules Task 8.6			Activities will include developing cost models	andconducting experimental validation of consequent	
microfibercomponents and modules Task 8.4 Activities will include developing cost models and Activities will include developing cost models and conducting esperimental validation of consequent near- term and long-term strates for producing microfiber Components and modules Task 8.6			andconducting experimental validation of consequent near-	near-term and long-term strategies for producing	
Task 8.4 Activities will include developing cost models and conducting experimental validation of consequent near-thread that and an analysis of the conducting experimental validation of consequent near-term and long-term strategies for producting experimental validation of consequent near-term and long-term strategies for producting experimental validation of consequent near-term and long-term strategies for producting experimental validation of consequent near-term and long-term strategies for producting experimental producting experimental producting experimental producting experimental validation of consequent near-term and long-term strategies for producting experimental producting experimental validation of consequent near-term and long-term strategies for producting experimental returns and long-term strategies for producting experimental validation of consequent near-term and long-term strategies for producting experimental returns and long-term strategies for producting experimental returns and long-term strategies for producing microfiber components and modules Task 8.6 salidation and testing of separator hardware technology Task 8.6 salidation and testing of separator hardware technology in the production for testion in the production production production production for testion in the production p			term and long-term strategies for producing	microfibercomponents and modules	
Activities will include developing cost models and devanced Technology and Manufacturing Institute (ArdM) 1110 NE Cricle Bind Corvallis, Oregon Data University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh PA 15250 Defeated University Characterization will also be performed at University of Pittsburgh Pa 25250 Defeated University Characterization will also be performed at University of Pittsburgh PA 25250 Defeated University Characterization will also be performed at University of Pittsburgh Pa 25250 Defeated University Characterization will also be performed at University of Pittsburgh Pa 25250 Defeated University Characterization will also be performed at University of Pittsburgh Pa 25250 Defeated University Characterization will also be per			microfibercomponents and modules	Task 8.4	
Advanced Technology and Manufacturing institute (ATAM) 1110 NE Circle BMS (Carvallis, Oregon on the state of the production microfiber omponents and modules and treating of separator hardware technology. Task 8.6 Task 8.2.3 Only intellectual, academic, and analytical activities (no location needed). Oregon State University Oregon State University Poregon State University Oregon Oregon Oregon State University Oregon Oreg			Task 8.4	Activities will include developing cost models and	
Manufacturing institute ATAMM 1110 NC Icricle Bild Corvallis, Oregon P3730 build and test laboratory P3731 build and test laboratory P3732 build and test laboratory P3731 build and test laboratory P3731 build and test laboratory P3731 build and test laboratory P3732 build and test laboratory P3732 build and test laboratory P3732 build and test laboratory P3731 build and test laboratory P3732 build and test laboratory P3732 build and test laboratory P3732 build and test labo	Oregon State University		Activities will include developing cost models and	conducting experimental validation of consequent near-	
ATAMU J110 NE Circle BMC drovallis, Oregon User facility with design, build and test laboratories Task 3.6 Fabrication and testing of separator hardware feedboology Task 3.2.3 Task 3.3 T	Advanced Technology and		conducting experimental validation of consequent near-	term and long-term strategies for producing microfiber	
Bild Covalitie, Oregon Diver facility with design, build and test laboratories	Manufacturing Institute		term and long-term strategies for producing microfiber	components and modules	Hewlett Packard(OSU has
build and test laboratories Fask 3.2.3 Origon State University Oregon State	(ATAMI) 1110 NE Circle		components and modules	Task 8.6	a 25 year lease on this
Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 8.6 Continuing partner that started in BP2 and has been a project partner since. BP3-BP3 scitivities are old interesting in laboratory. Task 8.6 Continuing partner that started in BP2 and has been a project partner since. BP3-BP3 activities are old interesting in laboratory. Task 8.6 Continuing partner that started in BP2 and has been a project partner since. BP3-BP3 activities in clock chemical treatment and numerical simulation. Task 6.1 Continuing partner that started in BP2 and has been a project partner since. BP3-BP3 activities in clock chemical treatment and numerical simulation. Task 6.1 Continuing partner that started in BP2 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 6.1 Continuing partner that started in BP2 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 6.1 Continuing partner that started in BP2 and has been a project partner since. BP3-BP3 activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous thin-film strippint and filtration; and modeling or partner since. BP3-BP3 activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous thin-film strippint and filtration; and modeling and simulation of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous thin-film strippint and filtration; and modeling and simulation of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous thin-film strippint and filtration; and modeling and simulation of reaction kinetics for a set of dispersant chemistries; operation of laboratory scale reactors for natural gas	Blvd Corvallis, Oregon	User facility with design,	Task 8.6	Fabrication and testing of separator hardware	facility from
Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.2.3 Only intellectual, academic, and analytical activities (no location needed) Task 3.3 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities will include acquisition of reaction kneeded) Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 5.8 Continuing partner that started in BP2 and has been a project partner since. BP3-BP3 Excitvities will include acquisition of reaction kneeded) Task 5.8 Continuing partner that started in BP2 and has been a project partner since. BP3-BP3 Excitvities will include acquisition of reaction kneeded) Task 5.8 Continuing partner that started in BP2 and has been a project partner since - BP3-BP3 Excitvities will include acquisition of reaction kneeded) Task 5.8 Continuing partner that started in BP2 and has been a project partner since - BP3-BP3 Excitvities will include acquisition of reaction kneeded on a project partner since - BP3-BP3 Excitvities will include acquisition of reaction kneeded or accurately accurate acquisition of acquisition of accurately accur	97330	build and test laboratories	Fabrication and testing of separator hardware technology	technology	HewlettPackard)
Task 3.23 Only intellectual, academic, and analytical activities (no location needed) Only intellectual, academic, and analytical activities (no location needed) Only intellectual, academic, and analytical activities (no location needed) Task 8.6 Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 activities are only intellectual, academic, and analytical activities (no location needed) Task 8.6 Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 activities include Chemical treatment and numerical simulation Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 6.1 Continuing partner that started in BP2 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries, operation of aboratory-scale continuous tribular and cavitation reactors; evaluation of continuous thin-film strippin and filtration, and modeling and simulation of reactor or process. Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Pacific Northwest Northwest Northwest Northwest Northwest Northwest Northwest Northwest Northwest Laboratory Space Task 10.4 Cost modelling, component design, material studies, planter on process Systems Enterprise Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no location needed) Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no location needed) Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no location needed) Task 9.6.1 Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 activities will				Task 3.2.3: Continuing partner that started in BP2 and	
Oregon State University Oregon State University CBEF. Glescon Hall2115 SW Oregon State University Office State Offic			Task 3.2.3		
Oregon State University Oregon State University CBEF. Glescon Hall2115 SW Oregon State University Office State Offic			Only intellectual, academic, and analytical activities (no	Only intellectual, academic, and analytical activities (no	
Case, Gleson Hall2115 SW Oregon State University chemical engineering laboratory (hemical engineering laboratory) Task 8.6 Continuing partner that started in BP2 and has been a project partner since. 8P3-8P5 Activities will include catalyst formulation of continuous thin-film strippinf and filtration; and modeling on Facility of Pittsburgh 940 Benedum Hall Pittsburgh (Pacility) Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous thin-film strippinf and filtration; and modeling only Facility and suite sill include catalyst formulation development, synthesis and testing in laboratory scale content will include catalyst formulation development, synthesis and testing in laboratory scale in laboratory, aboratory, Facility abo	Oregon State University				
As been a project partner since - BP3-BP5 activities project partner	Oregon State University			·	
As been a project partner since - BP3-BP5 activities project partner	CBEE, Gleeson Hall2115 SW	Oregon State University		Task 8.6: Continuing partner that started in BP2 and	
University of Pittsburgh 931 Benedum Hall Beredum Hall Development Facility Task 6.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) University of Pittsburgh Development Facility Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of sended melal, Pittsburgh, PA DedicatedUniversityLaborat on yfacility Task 6.7 Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh pacific Northwest Task 10.1 [FA] Co-Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no location ended) University of Pittsburgh pacing partner that started in BP1 and has been a project partner since - BP3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh pacing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh partner that started in BP1 and has been a project partner since - BP3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh partner that started in BP1 and h	Campus WayCorvallis, OR		Task 8.6		
Pittsburgh 931 Benedum Hall Dedicated University Research and Development Facility Development Facility Frober Laboratory 913 Benedum Hall, Pittsburgh PA Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and eavlatation reactors; evaluation of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and eavlatation reactors; evaluation of or freaction kinetics for a set of dispersant chemistries; operation of laboratory-scale dispersant chemistries; operation of laboratory-scale continuous tubular and eavlatation reactors; evaluation of continuous train and simulation of reactor or process. Task 5.8 Continuous thin-film strippinf and filtration; and modeling only Facility Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst Characterization will also be performed at University of Pittsburgh PA 15260 Dedicated University Laboratory Facility Dedicated University Laboratory Facility Dedicated University Laboratory Facility Dedicated University Laboratory Facility Dedicated University Laboratory Space Task 1.1 Task 1.1 [FA] Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no Delicated Continuing partner that started in BP1 and has been a project partner since. PB7-BF5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Continuing partner that started in BP1 and has been a project partner since. BP3-BF5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Continuing partner	97331	laboratory	Chemical treatment and numerical simulation	include Chemical treatment and numerical simulation	State of Oregon
Benedum Hall Pedicated University PA Past 5.8 Task 5.8 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (in Development Facility Task 5.8 Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of dispersant chemistries; operation of laboratory-scale continuous thusular and cavitation reactors; evaluation of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation and modeling and simulation of reactor or process. Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh PA 15260 Pacific Northwest National Laboratory, Space Pacific Northwest National Laboratory Space Process Systems Enterprise Dedicated Federal Laboratory Space Delicated Juniversity of Pittsburgh Pack Space Systems Enterprise Delicated Federal Catalyst Continuing partner that started in BP2 and has been a project partner since. PB3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP1 and has been a project partner since. PB3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at Univ	University of				
Pittsburgh, PA Research and Development Facility Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and simulation of reaction will and simulation of reaction of the process. Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Ca	Pittsburgh 931			Task 6.1	
Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and saimulation of reactor or process. Dedicated University and simulation of reactor or process. Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory or scale reactors for anatural gas conversion to themicals. Catalyst or natural gas conversion to themicals. Catalyst or pittsburgh, Dedicated University bedicated University be	Benedum Hall	Dedicated University		Continuing partner that started in BP1 and has been a	
Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling and simulation of reactor or process. Task 6.7	Pittsburgh, PA	Research and	Task 6.1	project partner since. Only intellectual, academic, and	
Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation; and modeling and simulation of reactor or process. Task 6.7 Task 6.7 Task 6.7 Task 6.7 Task 6.7 Task 6.7 Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Pacific Northwest Sta 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no intellectual, acad	15261	Development Facility	(FA) Leader for Focus Area- Natural Gas Upgrading	analytical activities (no location needed)	University
Task 5.8 Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation; and modeling and simulation of reactor or process. Task 6.7 Task 6.7 Task 6.7 Task 6.7 Task 6.7 Task 6.7 Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Pacific Northwest Sta 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no intellectual, acad					
Activities will include acquisition of reaction kinetics for a set of dispersant chemistries; operation of laboratory-scale continuous tubular and cavitation reactors; evaluation of focutinuous tubular and cavitation reactors; evaluation of continuous tubular and cavitation; and modeling of continuous tubular and cavitation; and modeling and simulation of reactor or process. Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst ormulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst ormulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst ormulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst ormulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Pat 15260 Pacific Pacific Pacific Northwest National (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no intellectual).					
University of Pittsburgh Veser Laboratory 913 Benedum Hall, Pittsburgh, PA Task 6.7 Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation of reactor or process. Task 10.1 [FA] Co-Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material			Task 5.8	has been a project partner since - BP3-BP5 Activities will	
Veser Laboratory 913 Benedum Hall, Pittsburgh, PA Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst beneficially private will also be performed at University of Pittsburgh PA 15260 Pacific Northwest National Laboratory, Racilator Northwest National Laboratory, Space Process Systems Enterprise Continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling of continuous thin-film strippinf and filtration; and modeling and simulation of reactor or process. Private Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst conversion to chemicals. Catalyst caracterization will also be performed at University of Pittsburgh Private owned Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no continuous tubular and cavitation reactors; evaluation of continuous thin-film strippinf and filtration; and modeling of continuous thin-film strippinf and filtration; and modeling and simulation of reactor or process. Private Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst Task 10.1 and 10.4 Continuous tubular and cavitation of reactor or process. Private Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, f					
Benedum Hall, Pittsburgh, PA or Facility and simulation of reactor or process. Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst or hard testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst desting in laboratory scale reactors for natural gas conversion to chemicals. Catalyst desting in laboratory scale reactors for natural gas conversion to chemicals. Catalyst desting in laboratory scale reactors for natural gas conversion to chemicals. Catalyst desting in laboratory scale reactors for natural gas conversion to chemicals. Catalyst desting in laboratory scale reactors for natural gas conversion to chemicals. Catalyst desting in laboratory scale reactors for natural gas conversion to chemicals. Catalyst desting in laboratory scale reactors for natural gas conversion to chemicals. Catalyst desting in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Task 10.1 [FA] Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Continuing partner that started in BP2 and has been a project partner since on the design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Continuing partner that started in BP2 and has been a project partner since only intellectual, academic, and analytical activities (no intellectual, academic, and	University of Pittsburgh		set of dispersant chemistries; operation of laboratory-scale	dispersant chemistries; operation of laboratory-scale	
PA ory Facility and simulation of reactor or process. Private Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh, PA 15260 Pacific Northwest National Laboratory, Richland WA Pag352 Process Systems Enterprise Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no) Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no) Task 6.7 Task 6.7 Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Task 10.1 Include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Task 10.1 [FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 [FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 [FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 [FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 [FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 [FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 [FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 [FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 [FA) Co -Leader for Focus Area - Module M	Veser Laboratory 913		continuous tubular and cavitation reactors; evaluation of	continuous tubular and cavitation reactors; evaluation	
Task 6.7 Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Task 10.4 In the started in BP2 and has been a project partner since - BP3-BP5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no intel	Benedum Hall, Pittsburgh,	DedicatedUniversityLaborat	continuous thin-film strippinf and filtration; and modeling	of continuous thin-film strippinf and filtration; and	
Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst or natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst conversion to chemicals. Catalyst conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 Task 10.1 [FA] Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no intellectual, academic, and analytical activities) include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reac	PA	ory Facility	and simulation of reactor or process.	modeling and simulation of reactor or process.	Private
Activities will include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst or natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst conversion to chemicals. Catalyst conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 Task 10.1 [FA] Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no intellectual, academic, and analytical activities) include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reactors for natural gas and testing in laboratory scale reac					
Synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh pha 15260 Pacific Northwest National Laboratory, Richland WA Pag352 Laboratory Space Process Systems Enterprise Synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no include catalyst formulation development, synthesis and testing in laboratory scale reactors for natural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no					
University of Pittsburgh 940 Benedum Hall Pittsburgh, PA 15260 Pacific Northwest National Laboratory, Richland WA P99352 Laboratory Space Pacistory Facility Process Systems Enterprise Inatural gas conversion to chemicals. Catalyst characterization will also be performed at University of Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no			Activities will include catalyst formulation development,	has been a project partner since - BP3-BP5 Activities will	
Benedum Hall Pittsburgh, PA 15260 Pacific Northwest National Laboratory, Richland WA P99352 Process Systems Enterprise Dedicated University Laboratory Space Characterization will also be performed at University of Pittsburgh Private owned Task 10.1 (FA) Co - Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no int	ĺ		T		
PA 15260 Laboratory Facility Pittsburgh Private owned Task 10.1 and 10.4 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Laboratory, Richland WA Dedicated Federal Laboratory Space Cost modelling, component design, material studies, fabrication subcontracts Fask 9.3 and 9.5 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no	University of Pittsburgh 940		natural gas conversion to chemicals. Catalyst	and testing in laboratory scale reactors for natural gas	
Pacific Northwest National Laboratory, P352 Laboratory Space Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no	Benedum Hall Pittsburgh,	Dedicated University	characterization will also be performed at University of	· · · · · · · · · · · · · · · · · · ·	
Pacific Northwest Northwest National Laboratory, Richland WA 19352 Task 9.3 and 9.5 Process Systems Enterprise Task 9.3 and 9.5 Northwest Task 10.1 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no	PA 15260	Laboratory Facility	Pittsburgh	also be performed at University of Pittsburgh	Private owned
Pacific Northwest Northwest National Laboratory, Richland WA 19352 Task 9.3 and 9.5 Process Systems Enterprise Task 9.3 and 9.5 Northwest Task 10.1 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 Task 10.1 (FA) Co -Leader for Focus Area - Module Manufacturing Task 10.4 Cost modelling, component design, material studies, fabrication subcontracts DOE Task 9.3 and 9.5 Continuing partner that started in BP1 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no					
Northwest National Laboratory, Richland WA Dedicated Federal Laboratory Space Task 10.4 Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no	ĺ				
National Laboratory, Pask 10.4 Cost modelling, component design, material studies, fabrication subcontracts Fask 9.3 and 9.5 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no	Pacific			= :	
Laboratory, Richland WA Dedicated Federal Jask 10.4 Cost modelling, component design, material studies, fabrication subcontracts Fask 9.3 and 9.5 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only Intellectual, academic, and analytical activities (no	Northwest			project partner since - BP3-BP5 Task 10.1	
Richland WA Dedicated Federal Laboratory Space Fabrication subcontracts Task 9.3 and 9.5 Cost modelling, component design, material studies, fabrication subcontracts Task 9.3 and 9.5 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only Intellectual, academic, and analytical activities (no	National			(FA) Co -Leader for Focus Area - Module Manufacturing	
Process Systems Enterprise fabrication subcontracts fabrication subcontracts fabrication subcontracts DOE Task 9.3 and 9.5 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no intellectual, academic,	Laboratory,		Task 10.4	Task 10.4	
Task 9.3 and 9.5 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only Intellectual, academic, and analytical activities (no intellectual, academic, and analytical activities (no intellectual, academic, and analytical activities)	Richland WA	Dedicated Federal			
Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only Process Systems Enterprise Only intellectual, academic, and analytical activities (no intellectual, academic, and analytical activities (no intellectual, academic, and analytical activities)	99352	Laboratory Space	fabrication subcontracts	fabrication subcontracts	DOE
Task 9.3 and 9.5 Process Systems Enterprise Task 9.3 and 9.5 Only intellectual, academic, and analytical activities (no intellectual, academic, and analytical activities (no intellectual, academic, and analytical activities)					
Process Systems Enterprise Only intellectual, academic, and analytical activities (no intellectual, academic, and analytical activities (no				= :	
			Task 9.3 and 9.5	project partner since - BP3-BP5 activities are Only	
(PSE) location needed) location needed)	Process Systems Enterprise				
	(PSE)		location needed)	location needed)	

and .
and
ties will
rials
pared State University
and
ties will
С
ation
State University
and
ties will
сар
ion will
dusing
City
ntinuing
ct
thane
olid
Private
and
ties are
ies (no
and
ties
ation Private Ownership of
Building by Icogenex
and
anu
10
een a
c, and
University
and has
will
n, and
State
and
and
and ities
ities
odology Texas Tech University –
ities
odology Texas Tech University –
odology Texas Tech University – State property tt
i e C. i

Interpoliting (JMH) office (JMH) and					
Task 1.0.4 Continuing partner that started in BP2 and color international) Continuing partner that started in BP2 and sa Sear lease on children unmerical similations and high rate forming trials of the laminus.	University of New				
Manufacturing Center (12) Technology Dive Duhany Declaced University of South Carolina Sweeringen Singeneems Declaced University Obouth Carolina Sweeringen Declaced University Obouth Carolina Sweet Declaced Uni					
Interestry of South Carolina Swearingen (Engineering Center, Room Beach and Part Committee (Committee)					,
International Judicioration of the laminae. International Judiciorational Judicioratio	· ·				'
University of South Carolina (South Carolina (=	_ = = =	
South Carolina Swearingen Fingheering Contente, Room 3009 301 Main Street Oblimation, S.C. Research and Development Pacility Developmen		Laboratory Facility	forming trials of the laminae.	of the laminae.	International)
Swearingen frighreering Centers, Rooms 3007-301 Main Street Columbia, SC Rooms 2008 Development Facility (A) Leader for Focus Area - Intensified Process project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 8.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 8.1 Continuing partner that started in BP2 and has been a project partner since. New BP3 BP5 catholics and unavoratory testing of pressure awaing adoption (PSA) gas separation equipment using MF2 and traditional quality of South Carolina MR8 and the project partner since in Rev BP3 BP5 catholics and the project partner since in Rev BP3 BP5 catholics and the project partner since in Rev BP3 BP5 catholics and the project partner since in Rev BP3 BP5 catholics and the project partner since in Rev BP3 BP5 catholics and the project partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics and partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics are the search partner since in Rev BP3 BP5 catholics and partner since					
Engineering Cottente, Room SCO9 301 Main Street Oledicated University Research and Development Facility Task 8.1 Columbia, SC Research and Development Facility Task 8.4 Activities will include the design, development, fabrication and inboratory testing of pressure swaining adoption (FSA) gas separation equipment using MFSS and ratificiand packed beds. A "model" gas mature will be tested considered to the columbia, SC 32208 University of South Carolina Ritter Laboratory 920 Main Street Columbia, SC 32208 University of South Carolina Ritter Laboratory 920 Main Street Laboratory Pacility Decidicated University StreetColumbia, SC 32208 Decidicated University Decidicated University StreetColumbia, SC 32208 Decidicated University Research and Decidicated University Research and Decidicated University Decidicated University Treas at Austin Process Science and Technology Center, DLPickle Research Nation Lipickle Research Nation Lipickle Research Nation Treas Science Austin Process Science and Technology Center, DLPickle Research Nation Treas Science Austin Process Science Austin P	South Carolina				
Task 8.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) University of South Carolina (FA) Leader for Focus Area - Intensified Process project partner since. Only intellectual, academic, and analytical activities (no location needed) University of South Carolina (FA) Leader for Focus Area - Intensified Process project partner since. Only intellectual, academic, and analytical activities (no location needed) University of South Carolina (FA) Leader for Focus Area - Chemical and Commodity of South Carolina (FA) Leader for Focus Area - Chemical and Commodity Processing of CO2 and CM4. All false are equipped with from each of the search and Processing of CO2 and CM4. All false are equipped with from each of the search and Commodity Processing of CO2 and CM4. All false are equipped with from each of the search and Commodity Processing of CO2 and CM4. All false are equipped with from each of the search and Commodity Processing of CO2 and CM4. All false are equipped with from each of the search and Commodity Processing and the search and Commodity Processing and Commodity	Swearingen				
Size 2018 Main Street Columbia, SC Research and Gewelopment Facility Particular Street Columbia, SC Research and Overlopment Facility Particular Street Columbia, SC Research and Overlopment Facility Particular Street Columbia, SC Research and Street Columbia, SC Research and Industry testing of pressure swaing adsorption (PSA) gas separation equipment using MFES and Traditional packed beds. A "model" gas mixine will be tested National packed beds. A "model" gas mixine will be tested National packed beds. A "model" gas mixine will be tested National packed beds. A "model" gas mixine will be tested National packed beds. A "model" gas mixine will be tested National packed beds. A "model" gas mixine will be tested National packed beds. A "model" gas mixine will be tested National Packed National Packed National Packed National Packed National Packed National Packed National Nat	Engineering				
Street Octombis, SC Research and Geoleaned University and Development Facility Processing Processing Science and Commodity of South Carolina and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional participation and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional participation and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional participation and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional participation and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional participation and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional participation and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional participation and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional participation and absoratory testing of pressure swaing adsorption (PSA) gas separation equipment using MFS and traditional participation and project partner since. Only intellectual, academic, and analytical activities (not include the development of mathematical condex gas participation and presentations.) Task 5.4 (Activities will include experimental campaigns for pilot participation and presentations.) Task 5.4 (Activities will include experimental campaigns for pilot participation and presentations of nonventance properties for removal of acid gases (e.g., CO2) from natural and presentation of nonventance properties for r	Center, Room				
Columbia, SC Development Facility Columbia Colu	3C09 301 Main			Task 8.1	
Columbia, SC Sesarch and Development Facility Development fa	Street	Dedicated University	Task 8.1	Continuing partner that started in BP1 and has been a	
Development Facility Activities will include the design, development, fabrication and laboratory vesting of pressure swaing adsorption (PSA) gas separation equipment using MFES and traditional packed beds. A "modef gas mixture wall be tested consisting of CO2 and CH4. All labs are equipped with fume freezas at Austin 200 E Dean Keeton St. 25208 University of Texas at Austin 200 E Dean Research and PST22-1389 Development Facility Task 5.1 Continuing partner that started in BP2 and has been a project partner since - New BP3-BP5 activities are the same type and scale as previously reviewed activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since - New BP3-BP5 activities are the same type and scale as previously reviewed activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since - New BP3-BP5 activities are the same type and scale as previously reviewed activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since - New BP3-BP5 activities are the same type and scale as previously reviewed activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and project partner since. Only intellectual, academic, and project partner since - New BP3-BP5 activities include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and presentations. Task 5.4 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and appreciated analytical activities (no location needed) Task 5.4 Continuing partner that started in BP2 and has been a project partner since. Sep3-BP5 activities will include experimental campaigns for pilot has been a project partner since. BP3-BP5 activities will include experimental campaigns for pilot partner since activities (no location needed) Task 5.4 Task 5.5 Task 5.5 Task 6.5 Ta	Columbia, SC		(FA) Leader for Focus Area - Intensified Process		
Task 8.4: Continuing partner that started in BP2 and has been a project partner since. New BP3-BP5 workstyles and analytical activities (and the project partner since that started in BP2 and has been a project partner since. New BP3-BP5 workstyles and packed best. A "model" gas mixture will be tested consisting of CO2 and CH4. All labs are equipped with furm books for venting of the gas streams. Task 8.4: Continuing partner that started in BP2 and has been a project partner since. New BP3-BP5 activities are the two partners of the project partner since. See the partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner of Chemical Engineering, 200 as the own resident of the project partner since. Dely intellectual, academic, and analytical activities (no location needed) Task 5.4: Continuing partner that started in BP2 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 5.4: Continuing partner since - BP3-BP5 activities will include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications of the project partner since. Dely and has been a project partner since - BP3-BP5 activities will include preparation of reports, publications of t					University
Activities will include the design, development, fabrication and laboratory vesting of pressure away till extend on a laboratory value bedicated University process of the consisting of CO2 and CH4. All labs are equipped with fume receivance of CO2 and CH4. All labs are equipp	23200	Development ruenty		analytical activities (no location necaea)	OTHVCTSICY
and laboratory testing of pressure swaling addorption (PSA) gas separation equipment using MPEs and traditional packed beds. A "model" gas mixture will be tested consisting of CO2 and CHA. All labs are equipped with fume hoods for venting of the gas streams. Task 8.4: Continuing partner that started in BP2 and base been a project partner since. New BP3-BP5 activities and been a project partner since. New BP3-BP5 activities and project partner since. New BP3-BP5 activities are project partner since. New BP3-BP5 activities are project partner since. New BP3-BP5 activities. Task 5.1 Continuing partner that started in BP2 and has been a project partner since. New BP3-BP5 activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since. New BP3-BP5 activities and project partner since. New BP3-BP5 activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since. New BP3-BP5 activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since. New BP3-BP5 activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since. New BP3-BP5 activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since. New BP3-BP5 activities. Task 5.1 Continuing partner that started in BP1 and has been a project partner since. New BP3-BP5 activities. Task 5.4 Continuing partner that started in BP1 and has been a project partner since. New BP3-BP5 activities. Task 5.4 Continuing partner that started in BP1 and has been a project partner since. New BP3-BP5 activities. Task 5.4 Continuing partner that started in BP2 and has been a project partner since. New BP3-BP5 activities. Task 5.4 Activities will include experimental campalgris for pilot plant testing of the operation of reports, publications and presentations. Task 6.6 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (NoF) mater					
University of South Carolina Ritter Laboratory201 Main Sitter Laboratory Facility Laboratory Main Laboratory Facility Laboratory Main Labo			= ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '		
University of South Carolina Ca					
Sitter Laboratory 301 Main Sc 22908 University of Feasa at Austin 2000 Bear Road, Austin, TX 78758 Sitter Laboratory Science Columbia, Sc 22908 University of Feasa at Austin 2000 Bear Road, Austin, TX 84.5.1 Task 5.1 Task 5.2 Task 5.4 Task 5.4 Task 5.4 Activities include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and presentations. Task 5.2 Task 5.3 Task 5.4 Task 5.5 Task 5.5 Task 5.4 Task 5.5 Task 5.5 Task 5.5 Task 5.5 Task 5.5 Task 5.6 Task 5.6 Task 5.6 Task 5.6 Task 5.7 Task 5.7 Task 5.7 Task 5.7 Task 5.7 Task 5.7 Task 5.8 Task 5.8 Task 5.8 Task 5.9 Task 5.1 Task 5					
Decicated University of Texas at Austin (2016 Dean Austin, TX (201	'				
University of Texas at Austin, TX Processing Task 5.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 5.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 5.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities (no location needed) Task 5.1 Continuing partner that started in BP2 and has been a project partner since. BP3-BPS activities (computer simulations and optimization neatheralist and has been a project partner since. BP3-BPS activities (computer simulations and optimization calculations, as operations. Task 5.1 Continuing partner that started in BP2 and has been a project partner since. BP3-BPS activities (computer simulations and optimization calculations, as operations. Task 5.1 Continuing partner since. Only intellectual, academic, and analytical activities (no location needed) On the campus of Task 5.1 Continuing partner shat started in BP2 and has been a project partner since. BP3-BPS activities will include preparation and presentations. In the campus of Task 5.1 Continuing partner shat started in BP2 and has been a project partner since. BP3-BPS activities will include preparation and presentations. In the campus of Task 5.1 Continuing partner shat started in BP2 and has been a project partner since. BP3-BPS activities will include preparation and presentations. In the campus of Task 5.4 Continuing partner shat started in BP2 and has been a project partner since. BP3-BPS activities will include preparation of reports, publications and presentations. Task 5.4 Continuing partner shat started in BP2 and has been a project partner since. BP3-BPS activities will include preparation and characterization of novel analysis of the partner since and presentations. Task 5.4 Continuing partne	•				
Task 5.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and project partner since. BP3-BP5 activities minuted the development of mathematical models, computer simulations and optimization of calculations, as well the preparation of reports, publications saw well the preparation of reports, publications, as well the preparation of reports, publications. Task 5.1 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and project partner since only intellectual, academic, and project partner since only intellectual, academic, and analytical activities (no location needed) Task 5.4: Continuing partner that started in BP2 and has been a project partner since. BP3-BPS Activities will not the development of mathematical models, component of the project intellectual, academic, and analytical activities (no location methal organic framework (MOP) materials and related nanoparticles having outstanding separation of novel materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Task 8.3 Task 8.4: Contin		Laboratory Facility	hoods for venting of the gas streams.	reviewed activities.	State
200 E Dean Kesten St. Stop Austin, TX Research and Development Facility Task 5.1 (FA) Leader for Focus Area-Chemical and Commodity Processing Task 5.4 Task 5.4 Task 5.4 Task 5.4 Task 5.4 Task 5.4 Austin Micket and Sudder University Text St. Austin, TX78712 The University of Texas at Austin, TX78712 Task 5.4 Task 5.5 Task 6.6 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project of the operating strategies of the operation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operation and characterization of novel has been a project partner since. BP3-BP5 Activities will include preparation and	University of				
200 E Dean Kesten St. Stop Austin, TX Research and Development Facility Task 5.1 (FA) Leader for Focus Area-Chemical and Commodity Processing Task 5.4 Task 5.4 Task 5.4 Task 5.4 Task 5.4 Task 5.4 Austin Micket and Sudder University Text St. Austin, TX78712 The University of Texas at Austin, TX78712 Task 5.4 Task 5.5 Task 6.6 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project of the operating strategies of the operation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Continuing partner that started in BP1 and has been a project partner since. Only intellectual, academic, and analytical activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operation and characterization of novel has been a project partner since. BP3-BP5 Activities will include preparation and	Texas at Austin				
Austin, TX Research and Development Facility Processing Tak 5.4 Activities will include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and presentations. Tak 5.4 Activities include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and potimization and presentations. Tak 5.4 Activities include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and potimization and optimization and presentations. Dedicated university and presentations. Dedicated university Dedic	200 E Dean			Task 5.1	
Austin, TX Research and Development Facility Processing Tak 5.4 Activities will include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and presentations. Tak 5.4 Activities include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and potimization and presentations. Tak 5.4 Activities include the development of mathematical models, computer simulations and optimization calculations, as well the preparation of reports, publications and potimization and optimization and presentations. Dedicated university and presentations. Dedicated university Dedic	Keeton St. Stop	Dedicated University	Task 5.1	Continuing partner that started in BP1 and has been a	
Development Facility The University of Texas at Austin McKetta Dedicated university building offering office Department offchemical Engineering, 200 East Dean Engineering, 200 East Dean Engineering, 200 East Dean Working on the theoretical Kecton SL, Austin, TX/8712 Task 5.4 Austin McKetta Dedicated university building offering office Component of the project The University of Texas at Austin, Process Science and Technology Center, J.J.Pickie Research Campus, TX 78758 Task 5.4 Task 5.5 Task 5.4 Task 5.5 Task 5.4 Task 5.5 Task 5.4 Task 5.4 Task 5.5 Task 5.4 Task 5.5 Task 5.6 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related annoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 6.7 Task 6.7	·	, ·			
Dedicated university of Texas at Austin McKetta Department of Chemical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories critical Engineering, 20 East Deam Korting on the theories and presentations, as well the preparation of reports, publications and presentations. Deficial Engineering, 20 East Deam Korting on the theories include the development of mathematical models, computer simulations and optimization calculations, as On the campus of T University of Texas at Austin, Process Science and Present theories and presentations. Task 5.4 Engineering Color Engineering Color Engineering Science Building at Work 20506 UTRC Dedicated University Laboratory Facility Dedicated University Color Engineering Science Building at Work 20506 Evan Stech University MER Dedicated University Dedicated University Laboratory Facility Dedicated University Color Engineering Science Building at Work 20506 Evan Stech University MER Dedicated University Dedicated University Laboratory Facility Dedicated University Color Engineering Science Building at Work 20506 Evan Stech University MER Dedicated University Dedicated University Laboratory Facility Dedicated University Color Engineering Science Building at Work 20506 Evan Stech University MER Dedicated University De					University
The University of Texas at Austin RER Building Austin Austin McKetta Department of Chemical Engineering, 200 East Deam working on the theoretical Keepineering, 200 East Deam working on the theoretical Component of the project The University of Texas at Austin ERB Building Austin PX 732 The University of Texas at Austin ERB Building Austin PX 732 The University of Texas at Austin ERB Building Austin PX 732 The University of Texas at Austin ERB Building Austin PX 732 The University of Texas at Austin PX 78712 The University of Texas at Austin PX 732 The University of Texas at Austin PX 734 The University of Texas at Austin ERB Building Austin PX 734 The University of Texas at Austin ERB Building Austin PX 734 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB Building Austin PX 7344 The University of Texas at Austin ERB	70712 1303	Development ruenty	Trocessing	, , , , , , , , , , , , , , , , , , , ,	OTHVCTSICY
Austin McKetta Department of Chemical Departm	The University of Toyon at	Dadiestadiasit	Tools F 4	= :	
Department of Chemical Engineering, 200 East Deam working on the theoretical Keeton St., Austin, TX78712 component of the project The University of Texas at Austin. Process Science and Technology Center, J.J. Pickle Research Campus, laboratory with pilot plant 10100 Burnet Road, Austin, for research Task 6.6 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromantics. Catalyst characterization of word of the project catalysts will be explored for the applications in natural gas conversion to acetylene and aromantics. Catalyst characterization of university of Texas and the project catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromantics. Catalyst characterization of where the project partner since and control reports, publications and well the preparation of reports, publications and perferents, well the preparation of reports, publications and perferents and preparation of reports, publications and perferents well the preparation of reports, publications and perferents well the preparation of reports, publications and perferents and persentations. Task 5.4: Continuing partner that started in BP2 and has been a project partner since a PB3-BP5 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outside project partner					
Engineering, 200 East Deam Keeton St., Austin, TX78712 component of the project The University of Texas at Austin, Process Science and Component of the project TX 78758 Dedicated university and control room facilities for research Task 5.4 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project Task 6.6 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Dedicated University Laboratory Facility West Virginia University Engineering Science Building at WU 395 Evansdale Dr. Morgantown, Dedicated University Laboratory Facility Evansdale Dr. Morgantown, Dedicated University Laboratory Facility Evansdale Dr. Morgantown, Dedicated University Laboratory Facility Dedicated University Laborat					
Component of the project And presentations. Presentations. Presentations. Austin, TX78712 Component of the project The University of Texas at Austin, Process of the Operating Strategies developed in the Include experimental campaigns for pilot plant testing of the operating strategies developed in the project Task 5.4 Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project Task 5.6 Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project Task 6.6 Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas.				· · · · · · · · · · · · · · · · · · ·	•
The University of Texas at Austin, Process Science and Technology Center, L.J.Pickle Research Campus, 10100 Burnet Road, Austin, and control room facilities project and control room facilities will include preparation and control room facilities project and control room facilities project and control room facilities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing, Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out		_			-
Austin, Process Science and Technology Center, J. P. Dedicated university Dedicated university and control room facilities for research project Task 5.4 (Include experimental campaigns for pilot plant testing of the operating strategies developed in the project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project partner since. BP3-BP5 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and has been a project partner since. BP3-BP5 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization of weight of the application of acetylene and aromatics. Catalyst characterization of mechanism. Texas Tech University MER		component of the project	and presentations.	presentations	Austin. State property.
andTechnology Center, JJ.Pickle Research Campus, 10100 Burnet Road, Austin, TX 78758 Task 5.4: Continuing partner that started in BP2 and has been a project partner since. BP3-BP5 Activities will university of research Task 6.6 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include sperimental campaigns for pilot plant testing of the operating strategies developed in the project Task 6.6. Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive anatys will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst Characterization of water Task 8.3. Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive analysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction matural gas. Task 8.3. Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor des	The University of Texas at				
Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project and the project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project and the project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project and has been a project partner since. BP3-BP5 Activities will include experimental campaigns for pilot plant testing of the operating strategies developed in the project and the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed in the project and plant testing of the operating strategies developed	Austin, Process Science				
10100 Burnet Road, Austin, and control room facilities for research project pr	andTechnology Center,	Dedicated university	Task 5.4	Task 5.4: Continuing partner that started in BP2 and	
10100 Burnet Road, Austin, and control room facilities for research project pr	J.J.Pickle Research Campus,	laboratory with pilot plant	Activities will include experimental campaigns for pilot	has been a project partner since. BP3-BP5 Activities will	On the campus of The
TX 78758 for research project of the operating strategies developed in the project Austin. State prope Task 6.6 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst Characterization will be carried out to elucidate reaction mechanism. Task 8.3 acontinuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities will include small scale microwave catalytic catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Task 8.3 activites include characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER	10100 Burnet Road, Austin,			include experimental campaigns for pilot plant testing	University of Texas at
Task 6.6 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 UTASK 9.3 UTRC Task 6.7 Task 6.6 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 UTRC UTRC Task 6.7 Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. State Task 8.3 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction will be carried out to elucidate reaction owned. Task 8.8. activities include characterization of water	TX 78758			1	-
Task 6.6 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst Evansdale Dr. Morgantown, Dedicated University Laboratory Facility Evansdale Dr. Morgantown, Dedicated University Evans for the policiated university and the properties for removal of acid gases (e.g. CO2) from natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Task 8.3 Task 6.7 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gesparation properties for removal of acid gases (e.g. CO2) from natural gas. State Task 8.3: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities (no location needed) Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER			[]		
Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include preparation and characterization of novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. State Task 8.3: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed) Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the application will be carried out to elucidate reaction mechanism. Dedicated University each of the application of water in the university each of the application of water in the properties for removal of acid gases (e.g. CO2) from natural and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural separation properties for removal of acid gases (e.g. CO2) from natural gas conversion properties for removal of acid gases (e.g. CO2) from natural separation properties for removal of acid gases (e.g. CO2) from natural gas conversion properties for removal of acid gases (e.g. CO2) from natural gas feature and related			Task 6 6	= :	
novel nanocomposite membranes based on recently discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst Evansdale Dr. Morgantown, WV 20506 Task 8.3 continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER					
discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural gas. TX 78712 Dedicated University Laboratory Facility M20506 Texas Tech University MER discovered metal organic framework (MOF) materials and related nanoparticles having outstanding separation properties for removal of acid gases (e.g. CO2) from natural separation properties for removal of acid gases (e.g. CO2) from natural gas. Task 8.3 COLD from natural gas. Task 8.3: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities (no location needed) Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER discovered metal organic framework (MOF) materials and related nanoparticles having outstanding and related nanoparticles for removal of acid gases (e.g. CO2) from natural gas. Task 8.3					
The University of Texas at Austin EER Building Austin TX 78712 Dedicated University Laboratory Facility Eaboratory Facility Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalysts will be carried out to elucidate reaction mechanism. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the application owned Texas Tech University MER Task 8.3: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism.					
Austin EER Building Austin TX 78712 Dedicated University Laboratory Facility ass. Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst WV 20506 Evansdale Dr. Morgantown, Dedicated University Laboratory Facility Dedicated University Laboratory Facility properties for removal of acid gases (e.g. CO2) from natural gas conversion for acid gases (e.g. CO2) from natural gas conversion for acid gases (e.g. CO2) from natural gas. Task 8.3: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities (no location needed) Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Dedicated University Laboratory Facility Dedicated University Laboratory Facili				=	
TX 78712 Laboratory Facility gas. CO2) from natural gas. State Task 8.3 Task 8.3 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Task 6.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities (no location needed) Task 6.7 Task 6.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER Task 8.3 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Task 6.7 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism.				_ = = =	
Task 8.3 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 activities are Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction where the same converse on to acetylene and aromatics. Task 8.8 activities include characterization of water Task 8.3 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER Task 8.3 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Task 8.3 Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction ween mechanism.				' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' ' '	
Task 8.3 Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst Evansdale Dr. Morgantown, Dedicated University Laboratory Facility mechanism. Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER	TX 78712	Laboratory Facility	gas.		State
Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst based p.r. Morgantown, V20506 Laboratory Facility Only intellectual, academic, and analytical activities (no location needed) Task 6.7 Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction whether the applications in the properties of the applications in the applicat				= :	
UTRC location needed) location needed) Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst be acetylene and aromatics. Catalyst will be carried out to elucidate reaction where the acet of whe acetylene and aromatics. Catalyst will be carried out to elucidate reaction where the acet of whe acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER Task 6.7					
Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst gas conversion to acetylene and aromatics. Catalyst gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic include small scale microwave catalytic microwave catalyti			Only intellectual, academic, and analytical activities (no	Only intellectual, academic, and analytical activities (no	
Task 6.7 Activities will include small scale microwave catalytic Engineering Science Building at WVU 395 Evansdale Dr. Morgantown, VV 20506 Laboratory Facility Task 6.7 Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Texas Tech University MER Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Owned Task 6.7: Continuing partner that started in BP2 and has been a project partner since - BP3-BP5 Activities will include small scale microwave catalytic include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. Owned Task 8.8. activites include characterization of water	UTRC		location needed)	location needed)	
Task 6.7 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored out to elucidate reaction will be carried out to elucidate reaction when the characterization will be carried out to elucidate reaction when the characterization of water Task 8.8. activites partner since - BP3-BP5 Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction when the characterization will be carried out to elucidate reaction when the characterization of water. Task 8.8. activites include characterization of water.				Task 6.7: Continuing partner that started in BP2 and	
Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst becaused Dr. Morgantown, Dedicated University www. 20506 Laboratory Facility mechanism. Activities will include small scale microwave catalytic reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversi			Task 6.7	= :	
West Virginia University Engineering Science Building at WVU 395 Evansdale Dr. Morgantown, WV 20506 Laboratory Facility Texas Tech University MER reactor design and testing. Zeolite based, electromagnetic sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in antural gas conversion to acetylene and aromatics. Catalyst will be explored for the applications in antural gas conversion to acetylene and aromatics. Catalyst swill be explored for the applications in antural gas conversion to acetylene and aromatics. Catalyst swill be explored for the applications in antural					
Engineering Science Building at WVU 395 Evansdale Dr. Morgantown, VV 20506 Laboratory Facility Texas Tech University MER sensitive catalysts will be explored for the applications in natural gas conversion to acetylene and aromatics. Catalyst gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. owned Task 8.8. activites include characterization of water	West Virginia University				
Building at WVU 395 Evansdale Dr. Morgantown, WV 20506 Laboratory Facility Texas Tech University MER Natural gas conversion to acetylene and aromatics. Catalyst characterization will be carried out to elucidate reaction mechanism. New 20506 Task 8.8. activites include characterization of water	,				
Evansdale Dr. Morgantown, Dedicated University WV 20506 Laboratory Facility mechanism. Characterization will be carried out to elucidate reaction mechanism. Characterization will be carried out to elucidate reaction mechanism. West Virginia State mechanism. West Virginia State mechanism. Owned Task 8.8. activites include characterization of water					
WV 20506 Laboratory Facility mechanism. mechanism. owned Texas Tech University MER Task 8.8. activites include characterization of water	-	Dadiostod Habrers	I :	IF The state of th	Mast Vissinia Ct-t-
Texas Tech University MER Task 8.8. activites include characterization of water	,				-
		Laboratory Facility	mechanism.		owned
115 and 212, 201D					
	115 and 212, 201D			samples, studies of fouling and scaling on membrane	
located,2500 Broadway, surfaces, and Constructing MVC-MD prototype for Texas Tech Universi	located,2500 Broadway,			surfaces, and Constructing MVC-MD prototype for	Texas Tech University –
Lubbock, TX 79409 University Campus Not active in BP1/BP2 future testing at remote sites State property	Lubbock, TX 79409	University Campus	Not active in BP1/BP2	future testing at remote sites	State property

Tayon Took University				
Texas Tech University				
MERC RM 212 (ffice) and				
MERC 210 (offices)			Task 8.8. Developing first-principles thermodynamics	
located,110 Boston Ave			and process simulation models; development of	Texas Tech University –
Lubbock, TX 79409	University Campus	Not active in BP1/BP2	membrane system designs	State property
Texes Tech University,				
ME209 located at			Task 8.8. activites include characterization of water	
Mechanical Engineering			samples, studies of fouling and scaling on membrane	
2703 7th St, Lubbock, TX			surfaces, and Constructing MVC-MD prototype for	Texas Tech University -
79409	University Campus	Not active in BP1/BP2	future testing at remote sites	State property
Universtiyh of Arkansas,				
Department of Chemical				
engineering 1475 West			Task 8.8 - Developing model produced waters for	
Cato Springs Road,	Dedicated University		testing, membrane fouling studies, and fabricatoin of	
Fayetteville AR 72703	Laboratory Facility	Not active in BP1/BP2	prototype testing equipment	University
University of				
Pittsburgh, Li Laboratory				
913	Dedicated University			
Benedum Hall	Laboratory Facility			
Pittsburgh, PA	, ,		Task 10.7 - lab scale Design, fabrication and testing of	
15261		Not active in BP1/BP2	3D-printed membrane on water/organic solutions	University
	You do not wish as it has a standard and d			
Lubrizol Corporation Pilot	Industrial pilot plant and			
Plant Facilities 29400	chemical research facility			
Lakeland Blvd Wickliffe,	in support of Lubrizol		Task 10.7 - Collection of wastewater for testing at the	
· ·	manufacturing	Tools 40 7 and antique to DD4 (DD2		Datasets
Ohio		Task 10.7 not active in BP1/BP2	University of Pittsburgh	Private