Research activities as described in the proposal cannot be accomplished as recommended by the Renewable Energy Council on February 18th. The focus group portion of the study cannot be separated from the activities associated with the activities related to FEL1 and FEL2 of the front end engineering and design. Reviewer 2 suggested the focus groups should be front loaded to be done at the same time as FEL 1 and FEL 2, not before. If it was implied during the Renewable Energy Council meeting that focus group discussion could be done prior to FEL1 and FEL2; that was a miscommunication. The focus groups must be done in close conjunction with FEL1 and FEL2 and incorporate the cost refinements that are associated with work activities in FEL1 and FEL2.

The foundation of this project is based on the NDSU/MBI partnership and without MBI and the cost refinements that will come with completion of FEL1 and FEL2, focus groups would be meaningless. MBI's technical expertise and the refined cost estimates for construction and operations are at the core of identifying the best market opportunities. Further without a partnership with MBI, NDSU does not have access to the confidential information needed to identify market opportunities, potential investors and the most likely road to commercialization.

Another goal of the focus groups is to help identify the best site potential for biomass processing depots. Location selection may potentially be influenced by producer's willingness to feed. Potential cost savings of AFEX preprocessed biomass is at the core of producer's willingness to feed. The information from completion of FEL2 is necessary to discuss potential costs and cost savings with livestock producers and commercial feeding operations.

MBI has already had extensive discussions with livestock producers that have indicated willingness to feed. We also have a letter of support from Elanco, a global feed additive company and division of Eli Lilly, and a commitment of technical advisory services. It is their belief that this technology could have significant impact and applicability. Elanco feels strongly about this project and will provide direct expertise of their personnel as part of this project. Please see attached letter from Elanco.

In addition to the letter from Elanco, please find attached a letter from Sinner Brothers and Bresnahan, a 1,800 head commercial livestock finishing operation in Casselton, ND expressing their support for the project. Their letter expresses interest in the technology and in the potential the technology has to provide and alternative lower cost high energy feed for their livestock operations.

The use of AFEX pre-processed biomass as a livestock feed is not the final application of the technology. Rather it is the initial market that will bridge the supply chain limitations associated with biomass bulk density and enormous volumes of biomass needed to feed a commercial scale biorefinery. AFEX biomass processing depots address that limitation by building a supply chain that feeds into the technology's initial market, ruminant livestock feed. It's a bridge between the chicken and egg problem of "can't build a biorefinery because there is no supply chain" and "can't build a supply chain because there are no commercial biorefineries".

A revised budget and timeline is below. Essentially we have divided the project into 2 phases. Phase one includes the producer focus group and interviews with commercial livestock operations based on cost estimates of design activities associated with FEL1 and FEL2 as well as the inventory of commercial

livestock operations in North Dakota. Upon completion of those activities a go no go decision will be made to proceed to the final stage FEL3.

Assuming a go decision after FEL2, next steps would be completion of FEL3 which would result in planning and design specifications with sufficient detail to obtain vendor quotes and begin to identify potential investors and business opportunities. The technology would be designed and ready for deployment.

Revised Budget.	NDIC Share	Applicant Share	Total Cost
NDSU			
Wages	$38,530		$38,530
Benefits	$11,559		$11,559
Travel	$6,000		$6,000
Printing, materials, communications	$100		$100
Indirect Costs	$36,535		$36,535
NDSU Subtotal	$92,724		$92,724
MBI Subcontract	$150,000	$242,931	$392,931
NDSU Total	$242,724		$485,655
MBI Subcontract			
Salary and Fringe Benefits		$92,435	$92,435
Travel		$5,000	$5,000
Subcontract EPC	$150,000	$18,000	$168,000
Indirect Costs (137.93%)	$0	$127,496	$127,496
MBI Total	$150,000	$242,931	$392,931
Project Summary			
NDIS Share	$242,724		$92,724
Matching (50% max.)	$242,931		
Project Total	$485,655		

Timeline	**Month**								
Description	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
FEL-1: Contract with Engineering, Procurement and Construcion (EPC) partner									
Completed AFEX Depot project scope and charter that address throughput, biomass types, biomass handling and storage									
Complete preliminary mass and energy balances for the Depot									
FEL 2: Complete design of depot-scale biomass handling, ammonia recovery, reactor, pelleting train									
Complete preliminary Depot layout, project schedule									
Complete preliminary Depot cost estimate (±30%)									
Inventory licensed commercial backgrounding and finishing lots									
Crop producer focus groups to evaluate wiliness to supply biomass									
Livestock producer focus groups to evaluate wiliness to feed AFEX pellets									
Document Preparation									

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Document Preparation									

Fine, Karlene K.

From: Holl Pfennig, Andrea
Sent: Wednesday, April 15, 2015 8:22 PM
To: Fine, Karlene K.
Subject: FW: NDSU MBI Biomaterial Iniative

Hi Karlene,

FYI.

Andrea.

From: Nancy Hodur [mailto:nancy.hodur@ndsu.edu]
Sent: Wednesday, April 15, 2015 10:45 AM
To: Holl Pfennig, Andrea
Subject: RE: NDSU MBI Biomaterial Iniative

Well we divided the project into two phases to respond to concerns regarding Go, No Go decisions into FEL 3 and making sure we had a market. If that is too confusing, I can submit the entire budget and we can write into the contract or plan of work that that decision would be make before going forward to FEL3. I mean that is what we would do regardless. If we got through FEL2 and the results were No Go, we would suspend immediately. Does that make sense. I am at my desk if it would be easier to explain via a phone call.
nancy

From: Holl Pfennig, Andrea [mailto:ahpfennig@nd.gov]
Sent: Wednesday, April 15, 2015 10:41 AM
To: Nancy Hodur
Cc: Fine, Karlene K.
Subject: RE: NDSU MBI Biomaterial Iniative

Hi Nancy,

Actually, could you provide some explanation on why the total project costs dropped from $728,316 to $485,655?

Thanks,
Andrea.

From: Nancy Hodur [mailto:nancy.hodur@ndsu.edu]
Sent: Wednesday, April 15, 2015 10:32 AM
To: Holl Pfennig, Andrea
Subject: RE: NDSU MBI Biomaterial Iniative

Thank you very much Andrea. I look for the call in information.
nancy

From: Holl Pfennig, Andrea [mailto:ahpfennig@nd.gov]
Sent: Wednesday, April 15, 2015 10:24 AM
To: Nancy Hodur
Cc: Fine, Karlene K.
Subject: RE: NDSU MBI Biomaterial Iniative