



SUNLIBB

Sustainable Liquid Biofuels from Biomass Biorefining

Grant Agreement no. 251132

Collaborative Project
EU 7th Framework Programme
ENERGY

Project duration: 1st October 2010 – 30th September 2014

Deliverable 9.3 “Coordination Plan”

Author: **Dr. Veronica Ongaro (University of York)**

Workpackage: **9**

Workpackage Leader: **Prof. Simon McQueen-Mason
(University of York)**

Due date: **December 2010**

Actual submission date: **18th July 2011**

Dissemination Level: **PU**

**Cooperation Plan SUNLIBB/CeProBIO consortia
Joint deliverables**

Join deliverables Deliverable number	Deliverable title	Lead Partners	Delivery Date
Area 1 crop development			
JD1.1	Plant material from Miscanthus breeding population and sugarcane delivered for saccharification analysis	Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) and Igor Polikarpov (Proj. 5 coordinator, Br) are responsible for delivering biomass sugarcane varieties and Luisa Trindade (P13, WU) for delivering Miscanthus samples to Leonardo Gomez (WP 5 leader, P1, UoY) for analysis	Month 12
JD1.2	Insights into the interactions between cell wall composition and saccharification in sugarcane and maize	Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br), Igor Polikarpov (Proj. 5 coordinator, Br) and Anete De Souza (Proj. 1 leader, Br), Mathieu Raymond (WP1 leader P6, INRA), Simon McQueen-Mason (WP 9 leader, P1, UoY), Leo Gomez (WP 5 leader, P1, UoY), Paul Dupree (WP3 leader, P9, UCAM-DBIO), Herman Hofte (WP2 leader, P6, INRA) and Wout Boerjan (WP4 leader, P12, VIB) to discuss the data on saccharification potential and wall composition	Month 24
JD1.3	Plant material from mapping populations delivered for saccharification analysis	Plant material will be delivered by Matthieu Raymond (WP1 leader P6, INRA), for maize, Luisa Trindade (P13, WU) for Miscanthus, and Anete De Souza (Proj. 1 coordinator, Br)for sugarcane.	Month 24
JD1.4	Markers for Miscanthus maize and sugarcane biomass saccharification identified	Markers will be identified by Matthieu Raymond (WP1 leader P6, INRA) for maize, Luisa Trindade (P13, WU) for Miscanthus, and Anete De Souza (Proj. 1 coordinator, Br) for sugarcane.	Month 34
Area 2 Transcriptomic studies			
JD2.1	Initial 15 target genes identified for mutant analysis in maize and sugarcane in Area 1	Paul Dupree (WP3 leader, P9, UCAM-DBIO) and Wout Boerjan (WP4 leader, P12, VIB) to make gene list available to Jeremy Derory (P4, Biogemma), Anete	Month 12

		De Souza (Proj1 coordinator, Br) and Glauca de Souza (Proj. 2 coordinator, Br)	
JD2.2	A detailed characterisation of patterns of secondary cell wall formation in stems of sugarcane and Miscanthus	Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) and Marcelo Ehlers Loureiro (Proj. 4 coordinator, Br) will section sugarcane stems and Luisa Trindade (P13, WU) will do the same for Miscanthus and work with Paul Dupree (WP3 leader, P9, UCAM-DBIO), Wout Boerjan (WP4 leader, P12, VIB) and Herman Hofte (WP2 leader, INRA, P6) to analyse composition	Month 24
JD2.3	High quality RNA extracts from appropriate stages of Miscanthus and sugarcane	Luisa Trindade (P13, WU) will provide RNA for Miscanthus, and Glauca de Souza (Proj. 2 coordinator, Br) for sugarcane	Month 15
JD2.4	Transcript profiles for the different stages of secondary cell wall development in Miscanthus, maize and sugarcane genes.	Luisa Trindade (P13, WU) will analyse transcript profiles for Miscanthus, Glauca de Souza (Proj.2 coordinator, Br) for sugarcane and Jérémy Derory (P4, Biogemma) for maize.	Month 26
JD2.5	Target genes identified for WP 3 and 4 from Miscanthus, maize and sugarcane	Target genes will be identified in Miscanthus by Luisa Trindade (P13, WU), in maize by Jeremy Derory (P4, Biogemma) and sugarcane by Glauca de Souza (Proj.2 coordinator, Br). Information will be given to Paul Dupree (WP3 leader, P9, UCAM-DBIO) and Wout Boerjan (WP4 leader, P12, VIB).	Month 24
Area 3 Cell wall polysaccharides			
JD3.1	Identification of gene candidates in matrix polysaccharide synthesis based on work in model species	Paul Dupree (WP3 leader, P9, UCAM-DBIO) and Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) will identify gene candidates in matrix polysaccharide synthesis based on work in model species and on already generated data obtained from Luisa Trindade (P13, WU) for Miscanthus, from Jeremy Derory (P4, Biogemma) for maize and from Glauca de Souza (Proj. 2 coordinator, Br) for sugarcane.	Month 6
JD3.2	Detailed characterisation of maize, Miscanthus and sugarcane matrix polysaccharides	Paul Dupree (WP3 leader, P9, UCAM-DBIO) and Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) will characterise matrix polysaccharides from maize, Miscanthus and sugarcane using material and data obtained from Jeremy Derory (P4, Biogemma) for maize, from Luisa Trindade (P13, WU) for	Month 24

		Miscanthus and Glaucia de Souza (Proj. 2 coordinator, Br) for sugarcane	
JD3.3	Identification of additional 30 gene candidates involved in matrix polysaccharide synthesis	Jeremy Derory (P4, Biogemma) and Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) to identify 30 gene candidates involved in matrix polysaccharide synthesis using data from maize, from Miscanthus provided by Luisa Trindade (P13, WU), from sugarcane provided by Glaucia de Souza (Proj. 2 coordinator, Br) and compared to homologous genes in model species by Paul Dupree (WP3 leader, P9, UCAM-DBIO).	Month 28
JD3.4	Identification of activity of 3 new enzyme activities	Paul Dupree (WP3 leader, P9, UCAM-DBIO) and Igor Polikarpov (Proj. 5 leader, Br) will identify 3 new enzyme activities	Month 30
JD3.5	Five maize or Miscanthus or sugarcane modified lines with altered cell wall polysaccharides characterised	Lines with altered cell wall polysaccharides will be generated from Miscanthus by Luisa Trindade (P13, WU), from sugarcane by Glaucia de Souza (Proj. 2 Leader, Br) and from maize by Jeremy Derory (P4, Biogemma) and characterised by Paul Dupree (WP3 leader, P9, UCAM-DBIO), Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) and Leonardo Gomez (WP 5 leader, P1, UoY)	Month 48
Area 4 Lignin			
JD4.1	Lignin biosynthesis gene orthologs from maize, Miscanthus and sugarcane	Wout Boerjan (WP4 leader, P12, VIB) has identified Arabidopsis genes involved in lignin biosynthesis. Orthologs of these genes will be identified in Miscanthus by Luisa Trindade (P13, WU), in maize by Jeremy Derory (P4, Biogemma), Matthieu Reymond (WP1 leader, P6, INRA) and in sugarcane by Marcelo Ehlers Loureiro (Proj. 4 coordinator, Br) using previously generated transcriptomic data combined with coexpression data.	Month 12
JD4.2	A catalogue of aromatic molecules from C4 plants; continuous throughout the project sugarcane maize	Wout Boerjan (WP4 leader, P12, VIB) and Marcelo Ehlers Loureiro (Proj. 4 coordinator, Br) will provide a catalogue of aromatic molecules from Miscanthus and sugarcane material monocot plants	Month 30
JD4.3	Phenolic Metabolic maps for maize and sugarcane,	Wout Boerjan (WP4 leader, P12, VIB), Glaucia de Souza (Proj. 2 coordinator,	Month 36

	integrating transcripts, metabolites and altered fluxes	Br) and Marcelo Ehlers Loureiro (Proj. 4 coordinator, Br) will provide phenolic metabolic maps for maize and sugarcane, integrating transcripts, metabolites and altered fluxes	
JD4.4	Set of novel target lignin genes in C4 grasses identified through a systems biology approach	Wout Boerjan (WP4 leader, P12, VIB), Glaucia de Souza (Proj. 2 coordinator, Br) and Marcelo Ehlers Loureiro (Proj. 4 coordinator, Br) will identify a set of novel target lignin genes in C4 grasses through a systems biology approach	Month 40
Area 5 Biomass deconstruction			
JD5.1	HT saccharification assay established in Brazil	Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) and Leonardo Gomez (WP5 leader, P1, UoY) will establish a HT saccharification assay in Brazil	Month 24
JD5.2	HT saccharification assay for maize, miscanthus and sugarcane validated	Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) and Leonardo Gomez (WP5 leader, P1, UoY) will validate a HT saccharification for maize, Miscanthus and sugarcane using samples provided by Luisa Trindade (P13, WU) in Miscanthus, by Matthieu Reymond (WP1 leader, P6, INRA) in maize and by Anete De Souza (Proj. 1 coordinator, Br) in sugarcane	Month 24
JD5.5	Miscanthus and sugarcane lines with more digestible biomass identified	Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) and Leonardo Gomez (WP5 leader, P1, UoY) will identify Miscanthus and sugarcane lines with more digestible biomass using HT saccharification.	Month 36
JD5.6	Detailed description of saccharide products released from biomass of 3 crops	Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) and Leonardo Gomez (WP5 leader, P1, UoY) will provide a detailed description of saccharide products released from biomass of maize, sugarcane and miscanthus	Month 36
JD5.7	Four new cellulases trialled for biomass saccharification	Igor Polikarpov (Proj. 5 coordinator, Br) and Leonardo Gomez (WP5 leader, P1, UoY) will trial at least four new cellulases or cellulase cocktails for biomass saccharification	Month 40
Area 6 Added value molecules			

JD6.1	A fully characterised range of hydrophobic molecules from sCO ₂ extracts of C4 biomass	Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br), Luisa Trindade (P13, WU) and Matthieu Raymond (WP1 leader, P6, INRA) will provide sugarcane, Miscanthus and maize biomass respectively to Andrew Hunt (WP6 leader, P1, UoY) who will deliver a fully characterised range of hydrophobic molecules from sCO ₂ extracts of biomass from these plants.	Month 20
JD6.2	Optimised sCO ₂ extraction protocols for marketable waxes and other compounds	Andrew Hunt (WP6 leader, P1, UoY) will optimise sCO ₂ extraction protocols for marketable waxes and other compounds. Scale up will be carried out by David Blomberg (P8, processum). Material will be provided by Luisa Trindade (P13, WU) for Miscanthus, by Matthieu Reymond (WP1 leader, P6, INRA) for maize and by Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, Br) for sugarcane.	Month 30
JD6.3	Production of high value phenolic compounds from C4 biomass	C4 Biomass will be pre-treated using different pretreatment methods by Duncan Macquarrie/Andrew Hunt (P1, UoY) and Leonardo Gomez (WP5 leader, P1, UoY). Wout Boerjan (WP4 leader, P12, VIB) will analyse the products generated to identify valuable lignin monomers and oligomers. Material will be provided by Luisa Trindade (P13, WU) for Miscanthus, by Matthieu Reymond (WP1 leader, P6, INRA) for maize and by Igor Polikarpov (Proj. 5 coordinator, Br) for sugarcane. Paulo Selegim (Proj. 6 coordinator, Br) will optimise lab scale fermentation of sugarcane and investigate the extraction of lignin and lignin breakdown products.	Month 36
Area 7 Process integration			
JD7.1	Lab scale fermentation of sugars from breakdown of maize, Miscanthus and sugarcane optimised	James Edwards (P2, Biocaldol), Paulo Selegim (Proj. 6 coordinator, Br) and Igor Polikarpov (Proj. 5 coordinator, Br) will identify new bacterial and yeast strains that will be optimised for the fermentation of sugars from maize, sugarcane and Miscanthus at lab scale. They will optimise lab scale fermentation of sugars from the 3 species.	Month 18
JD7.2			Month 24
JD7.3	In-silico optimisation studies from lab scale data	Paulo Selegim (Proj. 6 coordinator, Br) and Phillip Wright (P11, USFD) will	Month 30

	completed	carry out optimisation studies from lab scale fermentation data of C4 biomass	
JD7.4	Pilot scale analysis of 3 integrated process scenarios for each species	Paulo Selegim (Proj. 6 coordinator, Br), Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, CTBE, Br) and David Blomberg (P8, Processum) will carry out pilot scale analysis of 3 integrated process scenarios for Miscanthus, maize and sugarcane	Month 36
JD7.5	Pilot scale fermentation of sugars from maize, Miscanthus and sugarcane Biomass optimised	James Edwards (P2, Biocaldol), Paulo Selegim (Proj. 6 coordinator, Br) and Marcos Buckeridge (Proj. 2, 4 and 8 coordinator, CTBE, Br) will optimise pilot scale fermentation of sugars from maize, Miscanthus and sugarcane	Month 40
JD7.7	Recommendation on cost modelling and decision on which process(es) to develop	Paulo Selegim (Proj. 6 coordinator, Br) and Phillip Wright (P11, USFD) will make recommendation on cost modelling and decision on which process(es) to develop	Month 48
Area 8 Sustainability studies			
JD8.1	Biorefinery model workbook	Nigel Mortimer (P7, NorEner), and Paulo Selegim (Proj. 6 coordinator, Br) will develop a biorefinery model workbook	Month 24
Area 9 Administration and transference			
JD9.1	Agreement with Brazilian Sister Consortium signed by all parties	Simon McQueen-Mason (SUNLIBB coordinator, P1, UoY) and Igor Polikarpov (CeProBIO coordinator, Br) to coordinate that the agreement with Brazilian Sister Consortium is signed	Month 3
JD9.2	Coordination Plan	Simon McQueen-Mason (SUNLIBB coordinator, P1, UoY) and Igor Polikarpov (CeProBIO coordinator, Br) to write the Coordination plan	Month 3