Joint Deliverable Reports are available on the SUNLIBB website [www.sunlibb.eu](http://www.sunlibb.eu) (Members’ area).

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| Joint Deliverable  Number | Deliverable name | Lead Partners  & Description of work | Delivery date expected (project month) | Actual delivery date  (project month) | Comments |
| JD1.1 | Plant material from Miscanthus breeding population and sugar cane delivered for saccharification analysis | Marcos Buckeridge (MB) & Igor Polikarpov (IP) (CeProBIO) delivered biomass from sugarcane varieties toWP5 (P1) for analysis. Luisa Trindade (LT) (P13) delivered Miscanthus samples to WP5 for analysis. | 12 | 12 | Samples were delivered on time for analysis. |
| JD1.2 | Insights into the interactions between cell wall composition and saccharification in sugarcane and maize | MB, IP and Anete de Souza (AdS) (CeProBIO) shared and discussed data on cell wall composition and saccharification potential with SUNLIBB partners P6. P1, P9 and P12. | 24 | 24 | This was completed in month 24 for maize and Miscanthus, and month 50 for sugarcane. |
| JD1.3 | Plant material from mapping populations delivered for saccharification analysis | Plant material was delivered to P1 by Matthieu Reymond (MR) (P6) (maize), LT (P13) (Miscanthus) and AdS (CeProBIO) (sugarcane). | 24 | 34 | This was completed in month 24 for maize and Miscanthus, and month 34 for sugarcane. |
| JD1.4 | Markers for Miscanthus, maize and sugarcane biomass saccharification identified | Markers were identified by MR (P6) (maize), LT (P13) (Miscanthus) and AdS (CeProBIO) (sugarcane). | 34 | 48 | QTL were reported in maize, & possible QTL in Miscanthus and sugarcane at the final project meeting in Ghent, 2014. |
| JD2.1 | Initial 15 target genes identified for mutant analysis in maize and sugarcane | Paul Dupree (PD) (P9) and Wout Boerjan (WB) (P12) made gene list available to Jeremy Derory (JD) (P4), AdS and Glaucia de Souza (GdS) (CeProBIO). | 12 | 3 | Completed for polysaccharides in Month 3. |
| JD2.2 | A detailed characterization of patterns of secondary cell wall formation in stems of sugarcane and Miscanthus | MB & Marcelo Ehlers Loureiro (MEL) (CeProBIO) sectioned sugarcane stems. LT (P13) sectioned Miscanthus stems. PD (P9), WB (P12) and Herman Hofte (P6) analysed composition. | 24 | 24 |  |
| JD2.3 | High quality RNA extracts from appropriate stages of Miscanthus and sugarcane | LT (P13) provided RNA from Miscanthus. GdS (CeProBIO) provided RNA from sugarcane. | 15 | 30 | Completed by month 30 for Miscanthus. |
| JD2.4 | Transcript profiles for the different stages of secondary cell wall development in Miscanthus, maize and sugarcane genes | LT (P13) analysed transcript profiles for Miscanthus, JD (P4) did the same for maize & GdS (CeProBIO) analysed sugarcane. | 26 | 40 | Maize transcriptomic profile was delivered in month 26. Miscanthus transcriptomic profile was delivered in month 40. |
| JD2.5 | Target genes identified for WPs3&4 from Miscanthus, maize and sugarcane. | Target genes were identified in Miscanthus by LT (P13), in maize by JD (P4) and by GdS (CeProBIO) in sugarcane. Information was sent to PD (P9) and WB (P12). | 24 | 24/44 | Target genes were delivered for maize by month 24 and for Miscanthus by month 44. |
| JD3.1 | Identification of gene candidates in matrix polysaccharide synthesis based on work in model species. | PD (P9) and MB (CeProBIO) identified gene candidates in matrix polysaccharide synthesis based on work in model species and on data generated from LT (P13) (Miscanthus), JD (P4) (maize) and GdS (CeProBIO) (sugarcane). | 6 | 18 | This was achieved by month 18 for maize and sugarcane, but delayed for Miscanthus because the available genome sequence was of poor quality. |
| JD3.2 | Detailed characterization of maize, Miscanthus and sugarcane matrix polysaccharides | PD (P9) and MB (CeProBIO) characterized matrix polysaccharides from maize, Miscanthus and sugarcane, using material and data obtained from JD (P4) (maize), LT (P13) (Miscanthus) and GdS (CeProBIO) (sugarcane). | 24 | 30/36 | Achieved and completed as reported in D3.2 and D3.3 for maize and Miscanthus (month 30).  Sugarcane was completed in month 36. |
| JD3.3 | Identification of additional 30 gene candidates involved in matrix polysaccharide synthesis | JD (P4) and MB (CeProBIO) identified 30 gene candidates involved in matrix polysaccharide synthesis, using data from maize (JD), from Miscanthus (LT) and sugarcane (GdS), and compared with homologous genes in model species by PD (P9). | 28 | 30 | Achieved and completed as reported in D3.4 |
| JD3.4 | Identification of activities of 3 new enzymes | PD (P9) and IP (CeProBIO) identified 3 new enzymes. | 30 | 30 |  |
| JD3.5 | Five maize or Miscanthus or sugarcane modified lines with altered cell wall polysaccharides characterised | Maize lines with altered cell wall polysaccharides were provided from JD and characterized by PD (P9), MB (CeProBIO) and Leonardo Gomez (P1). | 48 | 50 | See D3.6 |
| JD4.1 | Lignin biosynthesis gene orthologues from maize, Miscanthus and sugarcane | WB (P12) identified Arabidopsis genes involved in lignin biosynthesis. Orthologs of these genes were identified in Miscanthus (LT), maize (JD & MR) and sugarcane (MEL), using previously generated transcriptomic data combined with co-expression data. | 12 | 20 | Completed in month 20 for maize.  The identification of orthologs was delayed in Miscanthus, due to the poor quality of the genome sequence data available. |
| JD4.2 | A catalogue of araomatic molecules from C4 plants: continuous throughout the project | WB (P12) and MEL (CeProBIO) provided a catalogue of aromatic molecules from maize, Miscanthus and sugarcane. | 30 | 36 | This was completed for maize and Miscanthus in month 30 and updated for sugarcane in month 50. |
| JD4.3 | Phenolic metabolic maps for maize and sugarcane, integrating transcripts, metabolites and altered fluxes | WB (P12), GdS & MEL (CeProBIO) provided phenolic metabolic maps for maize and sugarcane, integrating transcripts, metabolites and altered fluxes. | 40 | 48 |  |
| JD4.4 | Set of novel target lignin genes in C4 grasses identified through a systems biology approach | WB (P12), GdS & MEL (CeProBIO) identified a set of novel target lignin genes in C4 grasses, through a systems biology approach. | 40 | 40 |  |
| JD5.1 | High-Throughput (HT) saccharification assay established in Brazil | MB, IP (CeProBIO) and LG (P1) established a HT saccharification assay in Brazil. | 24 | 24 | A HT platform was set up in Sao Carlos by IP, and was optimized to deliver a range of functions for biomass characterization. |
| JD5.2 | HT saccharification assay validated for maize, Miscanthus and sugarcane | MB (CeProBIO) and LG (P1) validated the HT saccharification assay for biomass samples from maize (MR; P6), Miscanthus (LT; P13) and sugarcane (AdS; CeProBIO). | 24 | 24 | A saccharification assay was established and validated on hundreds of samples of maize, Miscanthus and sugarcane. |
| JD5.3 | Miscanthus and sugarcane lines with more digestible biomass identified | MB (CeProBIO) and LG (P1) identified Miscanthus and sugarcane lines with more digestible biomass using HT saccharification | 36 | 36 |  |
| JD5.4 | Detailed description of saccharide products released from biomass of 3 crops | MB (CeProBIO) and LG (P1) provided a detailed description of saccharide products released from maize, Miscanthus and sugarcane biomass | 36 | 36 |  |
| JD5.5 | Four new cellulases trialled for biomass saccharification | IP (CeProBIO) and LG (P1) trialled 4 new cellulases or cellulose cocktails for biomass saccharification | 40 | 40 |  |
| JD6.1 | A fully-characterised range of hydrophobic molecules from supercritical CO2 extracts of C4 biomass | MR (P6), LT (P13) and MB (CeProBIO) provided samples of maize, Miscanthus and sugarcane, respectively, to Andrew Hunt (AH) (P1). AH delivered a fully characterized range of hydrophobic molecules from sCO2 extraction of the biomass. | 20 | 20 |  |
| JD6.2 | Optimised sCO2 extraction protocols for marketable waxes and other compounds | AH (P1) optimized sCO2 extraction of marketable waxes and other compounds. Material was provided by MR (maize), LT (Miscanthus) and MB (sugarcane). | 30 | 30 |  |
| JD6.3 | Production of high value phenolic compounds from C4 biomass | Biomass was pre-treated using different methods by LG (P1). WB (P12) analysed the products generated to identify valuable lignin monomers and oligomers. Material was provided by MR (maize), LT (Miscanthus) and IP (sugarcane). Paulo Seleghim (PS) (CeProBIO) optimized lab-scale fermentation of sugarcane and investigated the extraction of lignin and lignin breakdown products. | 36 | 38 |  |
| JD7.1 | Lab-scale analysis of 10 integrated process scenarios using maize, Miscanthus and sugarcane |  | 24 | 30 |  |
| JD7.3 | *In-silico* optimization studies from lab-scale data completed | PS (CeProBIO) and Phillip Wright (PW) (P11) carried out optimization studies on lab-scale fermentation data | 30 | 38 |  |
| JD7.4 | Pilot-scale analysis of 3 integrated process scenarios for each species | PS and MB (CeProBIO) and David Blomberg (DB) (P8) carried out pilot-scale analysis of 3 integrated process scenarios for maize, Miscanthus and sugarcane | 36 | 48 |  |
| JD7.5 | Pilot-scale fermentation of sugars from maize, Miscanthus and sugarcane biomass optimized | Namdar Baghaei-Yazdi (P14), PS and MB (CeProBIO) optimized pilot-scale fermentation of sugars from maize, Miscanthus and sugarcane. | 40 | 48 |  |
| JD8.1 | Biorefinery model workbook | Nigel Mortimer (NM) (P7) and PS (CeProBIO) developed a biorefinery model workbook. | 24 | 27 | Collaboration took place to populate the Biorefinery Model workbook (D8.2) with Brazilian sugarcane data, to produce SUNLIBB Sugar Cane Biorefinery v012.xlxs, for JD8.1 |
| JD9.1 | Agreement with Brazilian sister consortium signed by all parties | Simon-McQueen-Mason (SMM) (P1) and IP (CeProBIO) coordinated the signing of the agreement between SUNLIBB and CeProBIO. | 3 | 17 | This deliverable was delayed, because the negotiations took longer than expected. |
| JD9.2 | Coordination Plan | SMM (P1) and IP (CeProBIO) wrote the coordination plan, detailing the Joint Deliverables | 3 | 10 | This deliverable was delayed, because the negotiations took longer than expected. |

Joint Deliverables – Reports

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| Joint Deliverable  Number | Written up |
| JD1.1 | Delivered from Brazil to WP5 month 12 |
| JD1.2 | Chemical and morphological characterization of sugarcane bagasse submitted to a delignification process for enhanced enzymatic digestibility. Rezende,C. *et al* (2011) Biotech for Biofuels 4:54 |
| JD1.3 | See JD1.1 |
| JD1.4 | Reported at Ghent meeting Sept 2014 (minute 14/148) |
| JD2.1 | D2.1 (maize); also done for sugar cane by month 3. |
| JD2.2 | D2.2 (maize & Miscanthus); also done for sugar cane by month 24. (e.g. Ghent minutes 14/157 and 14/185) |
| JD2.3 | D2.3 (Miscanthus); also done for sugar cane by month 48. |
| JD2.4 | D2.4 (Miscanthus); also done for maize (month 24) and sugar cane (month 48); reported at Ghent meeting (minute 14/152) |
| JD2.5 | D2.5 (maize & Miscanthus); also done for sugar cane (month 48) |
| JD3.1 | Pdf document JD3.1-JD3.4 to download |
| JD3.2 | Pdf document JD3.1-JD3.4 to download |
| JD3.3 | Pdf document JD3.1-JD3.4 to download |
| JD3.4 | Pdf document JD3.1-JD3.4 to download |
| JD3.5 | D3.6 |
| JD4.1 | Pdf document JD4.1 to download |
| JD4.2 | Pdf document JD4.2 to download |
| JD4.3 | D4.3 |
| JD4.4 | D4.5 |
| JD5.1 | Pdf document JD5.1 to download |
| JD5.2 | Pdf document JD5.2 to download |
| JD5.3 | D5.5 (Miscanthus); also done for sugar cane by month 40. |
| JD5.4 | D5.6 |
| JD5.5 | D5.8 |
| JD6.1 | Pdf document JD6.1 to download |
| JD6.2 | Pdf document JD6.2 to download |
| JD6.3 | D6.4 |
| JD7.1 | D7.2 |
| JD7.3 | Word document JD7.3 to download |
| JD7.4 | D7.4 |
| JD7.5 | D7.5 |
| JD8.1 | Excel file JD8.1 to download |
| JD9.1 | D9.2 |
| JD9.2 | D9.3 |