UNIFEI
Universidade Federal de Itajubá/MG

Seminario Virtual "Innovación y Valor Agregado en el Sector Azucarero del MERCOSUR"

ALGUNOS COMENTARIOS SOBRE MEDIO AMBIENTE, BIOREFINERIAS E HIBRIDIZACION COM PLANTAS DE BIODIESEL EM FABRICAS DE AZUCAR Y ALCOHOL

Prof. Dr. Electo Eduardo Silva Lora

NEST/UNIFEI/BRAZIL

2021

NEST/UNIFEI

Era una vez em 2014

Electo Eduardo Silva Lora, Mateus Henrique Rocha, José Carlos Escobar Palacio, Osvaldo José Venturini, Maria Luiza Grillo Renó and Oscar Almazán del Olmo

The sugar and alcohol industry in the biofuels and cogeneration era: a paradigm change (part I)

Paper presented at the XXVIII Congress of the International Society of Sugar Cane Technologists, Sao Paulo, Brazil, 24–27 June 2013 and published here with the agreement of the Society.

Sugar Industry 139 (2014) No. 1 | 28–36

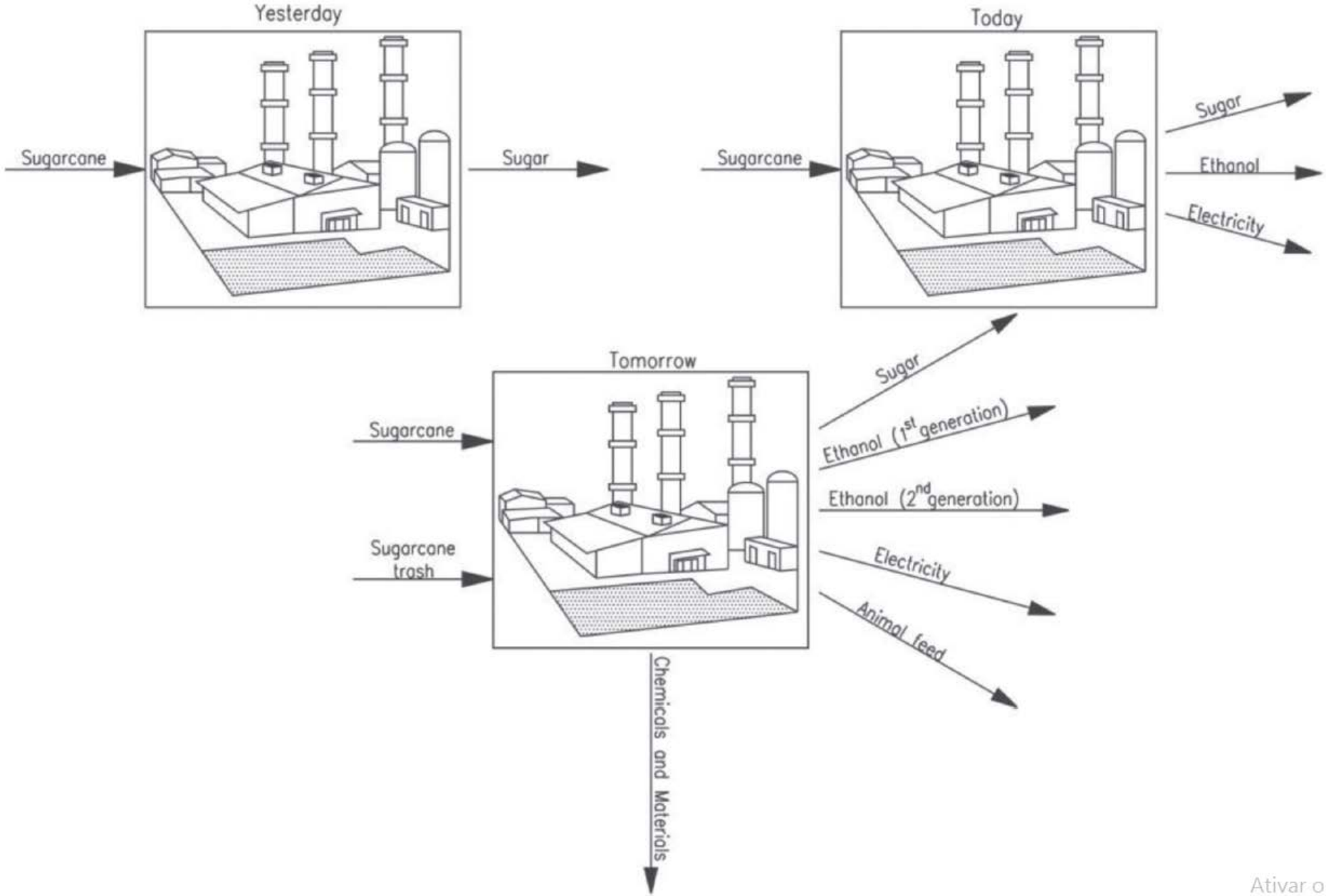


Fig. 1: Evolution of the diversification concept in sugar and alcohol factories

Los nuevos paradigmas.....

- – New sugarcane varieties and new agro techniques.
- – Reduction of energy consumption in the production process.
- – New alternatives of juice extraction (milling) systems.
- – Steam parameter increase in the cogeneration facilities.
- – New biofuel technologies: gasification, hydrolysis and genetically engineered microorganisms manipulation for biofuels production.
- – Vinasse and sugarcane trash energy conversion.
- – The production of commercial materials and chemicals as
- by-products.
- – Process integration.
- – The introduction of the biorefinery concept to transform
- biological materials into fuels, power, and chemicals using
- biological and chemical conversion processes.
- – Industrial ecology: integration to terrestrial geochemical cycles.
- – Sustainability assessment: Life Cycle Assessment (LCA).

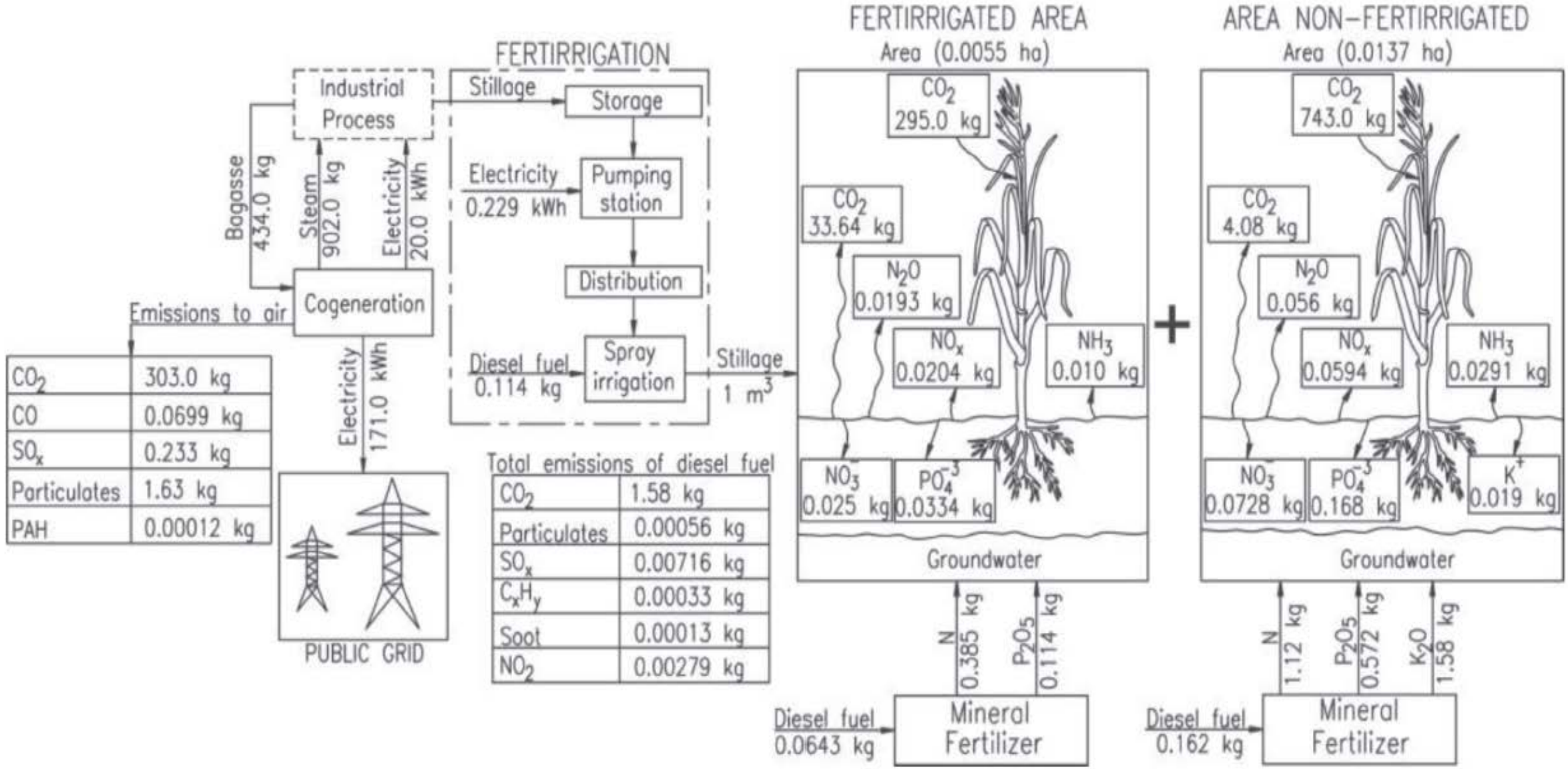


Fig. 17: Integration of the sugarcane agro-industry to geochemical cycles through fertirrigation (*Rocha* et al., 2010)

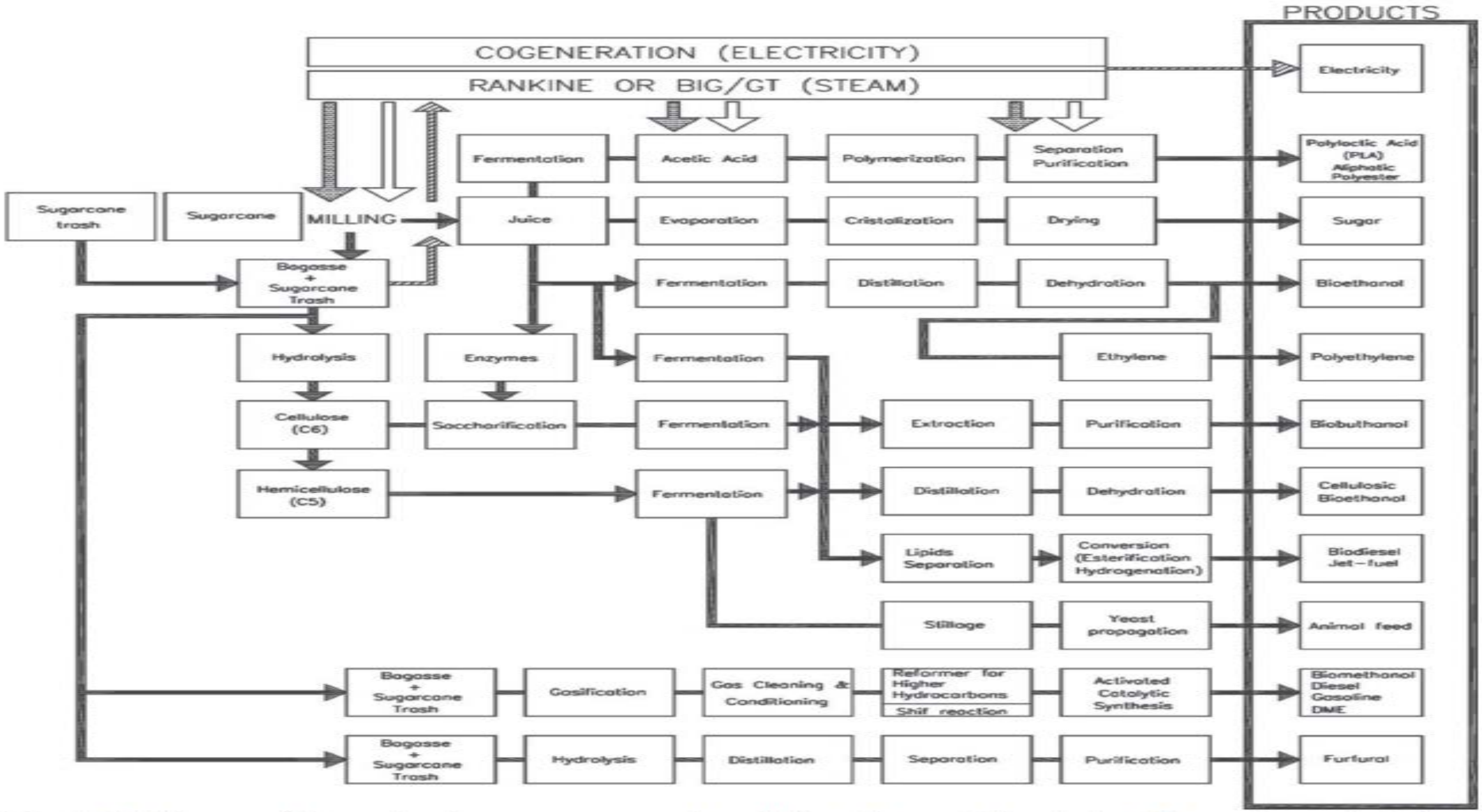


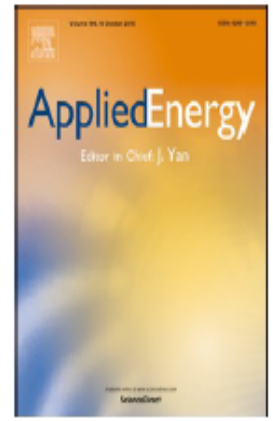
Fig. 13: Main possible routes in a sugarcane based biorefinery. Adapted and complemented from *Ambrósio* (2011)

Applied Energy 259 (2020) 113092

Contents lists available at ScienceDirect

Applied Energy

journal homepage: www.elsevier.com/locate/apenergy



Biorefineries productive alternatives optimization in the brazilian sugar and alcohol industry

Juarez Corrêa Furtado Júnior[a,b,*], José Carlos Escobar Palacio[b,*], Rafael Coradi Leme[c,*], Electo Eduardo Silva Lora[b,*], José Eduardo Loureiro da Costa[b], Arnaldo Martín Martínez Reyes[b], Oscar Almazán del Olmo[d]

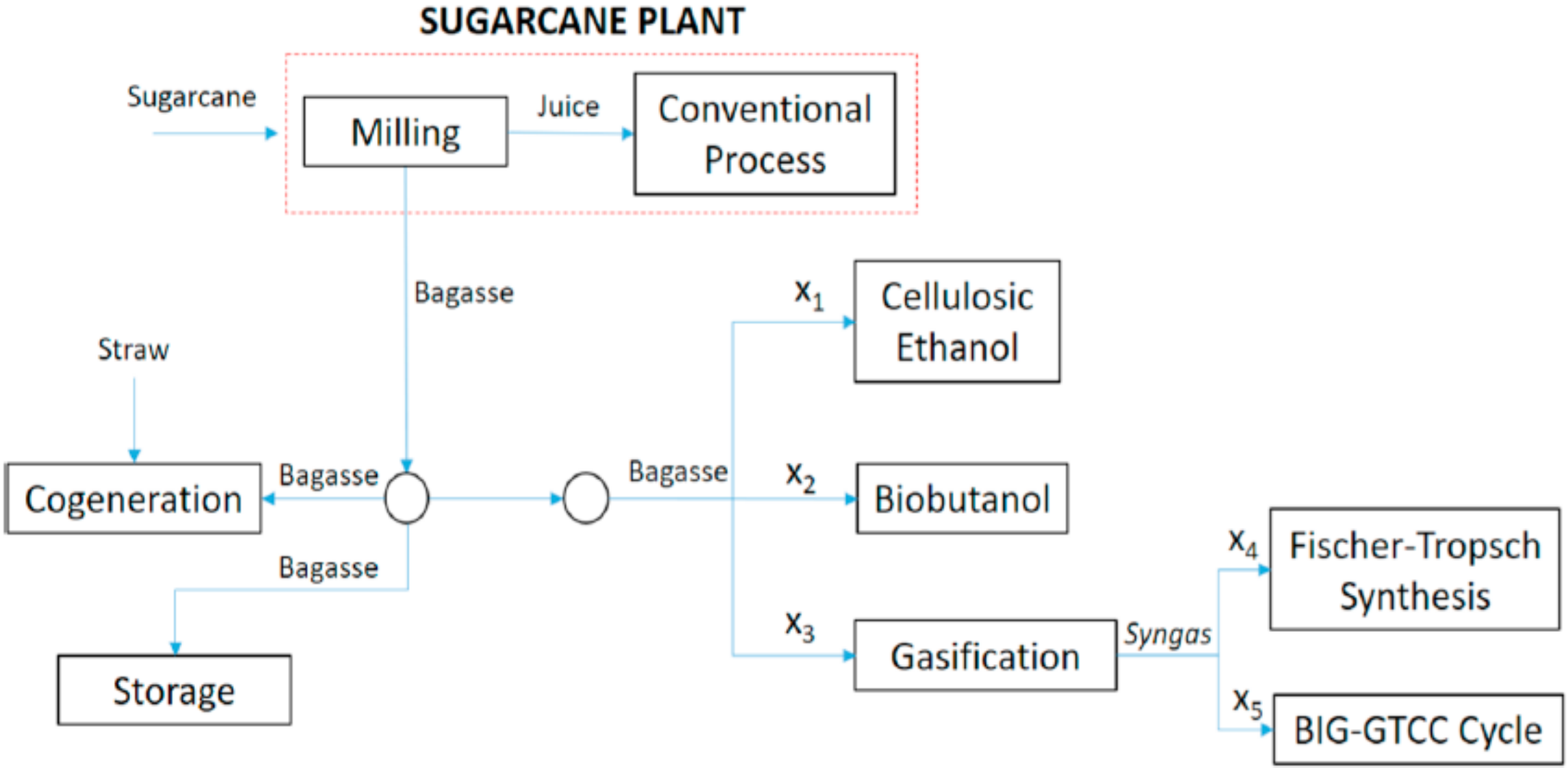


Fig. 2. Scheme of allocation of biomass in a biorefinery.

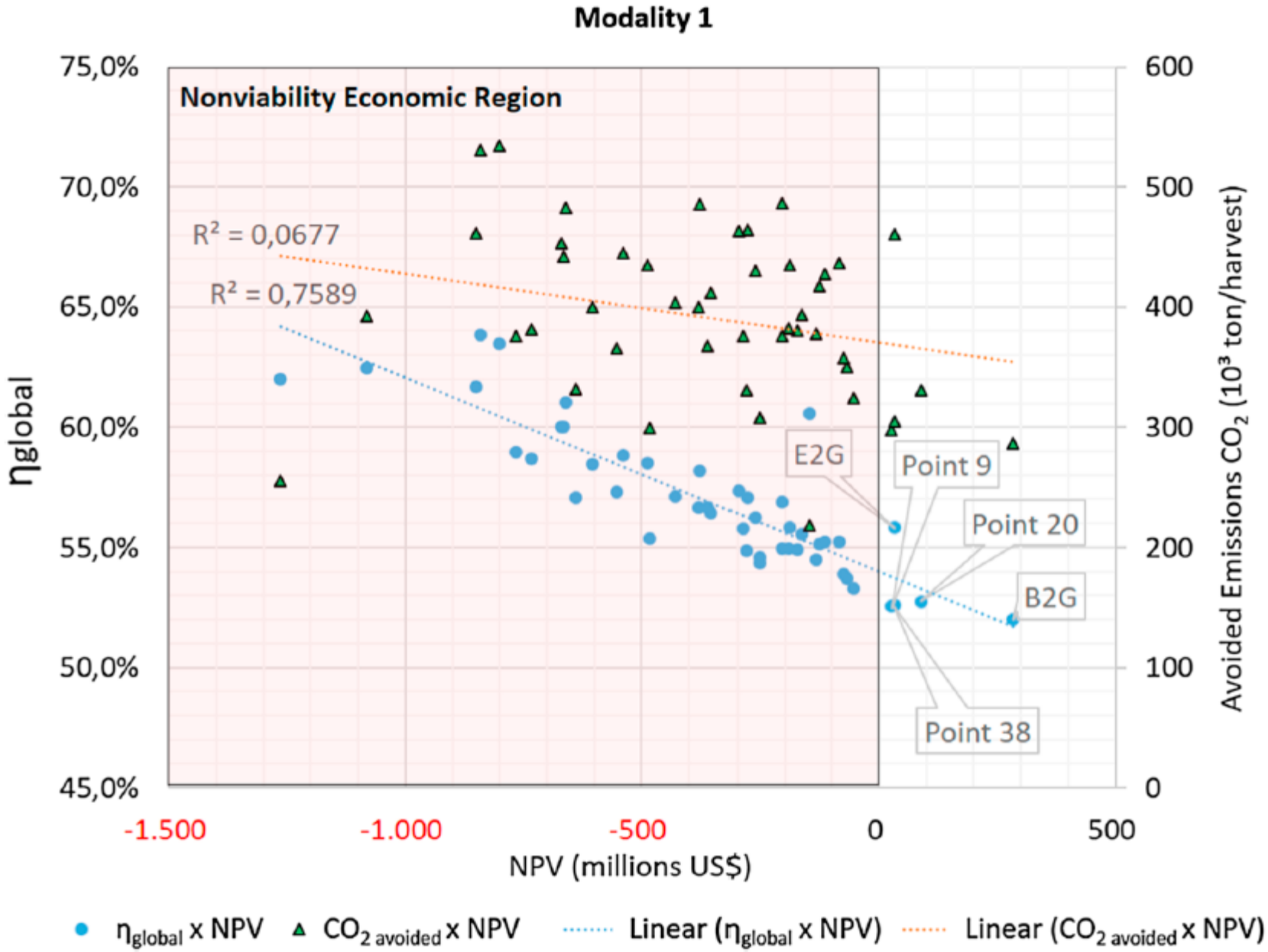
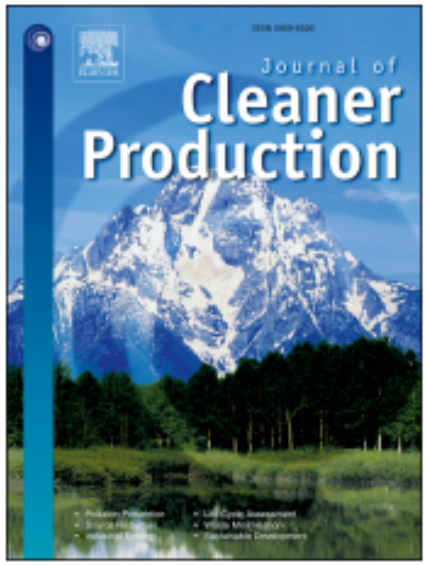


Fig. 12. Global Efficiency and Avoided Emissions as a function of NPV for modality 1.

Biodiesel de palma integrado a Bioetanol

Journal Pre-proof



Energy, economic, and environmental assessment of the integrated production of palm oil biodiesel and sugarcane ethanol

Eric Alberto Ocampo Batlle, José Carlos Escobar Palácio, Electo Eduardo Silva Lora, Edson Da Costa Bortoni, Luiz Augusto Horta Nogueira, Gaylord Enrique Carrillo Caballero, Alisson Aparecido Vitoriano Julio, Yulineth Cárdenas Escorcia

PII: S0959-6526(21)01856-4

DOI: https://doi.org/10.1016/j.jclepro.2021.127638

Reference: JCLP 127638

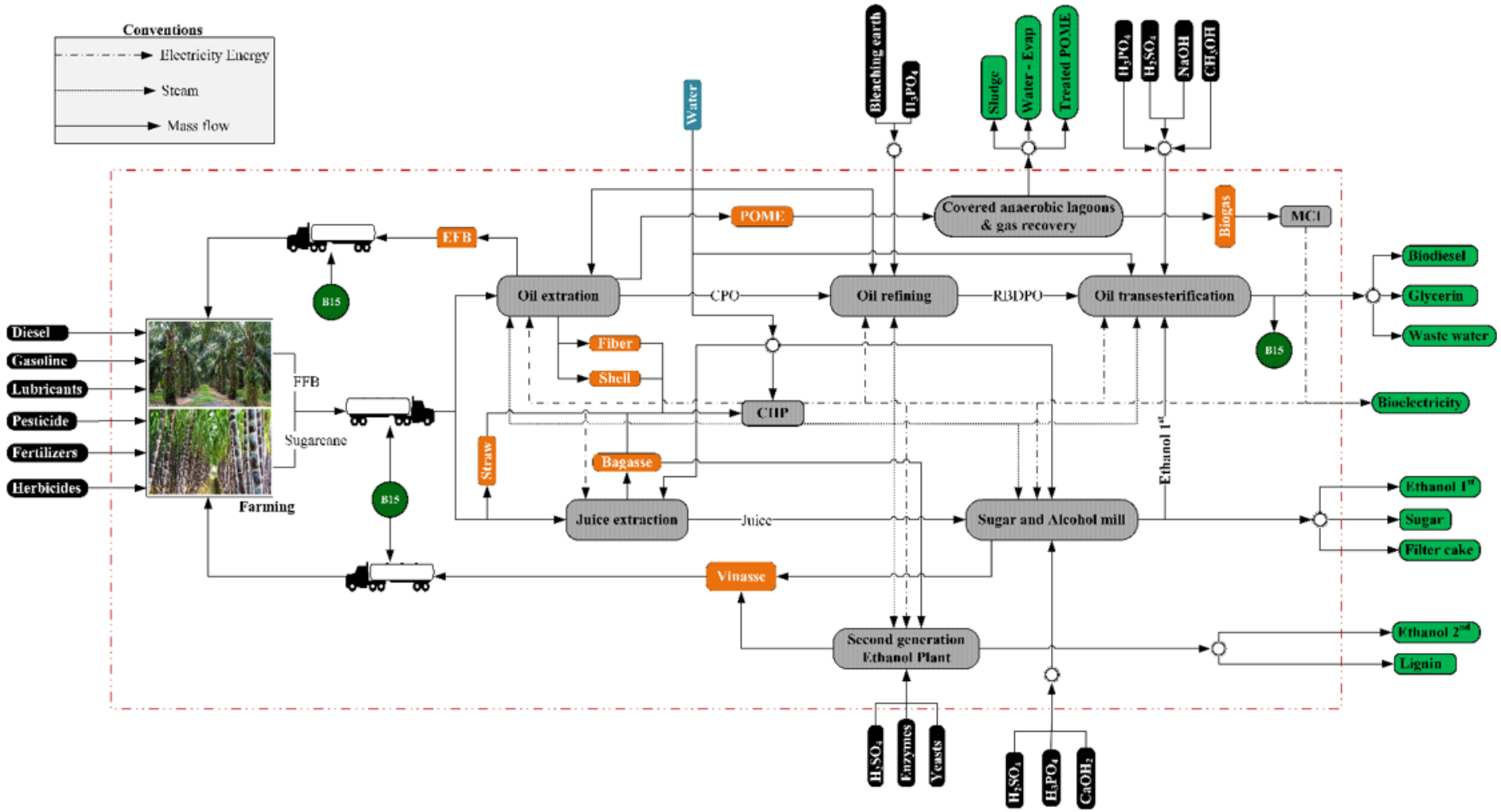


Figure 2.3: Integrated system of palm oil biodiesel and ethanol (1st and 2nd generation) sugarcane - IBSc.

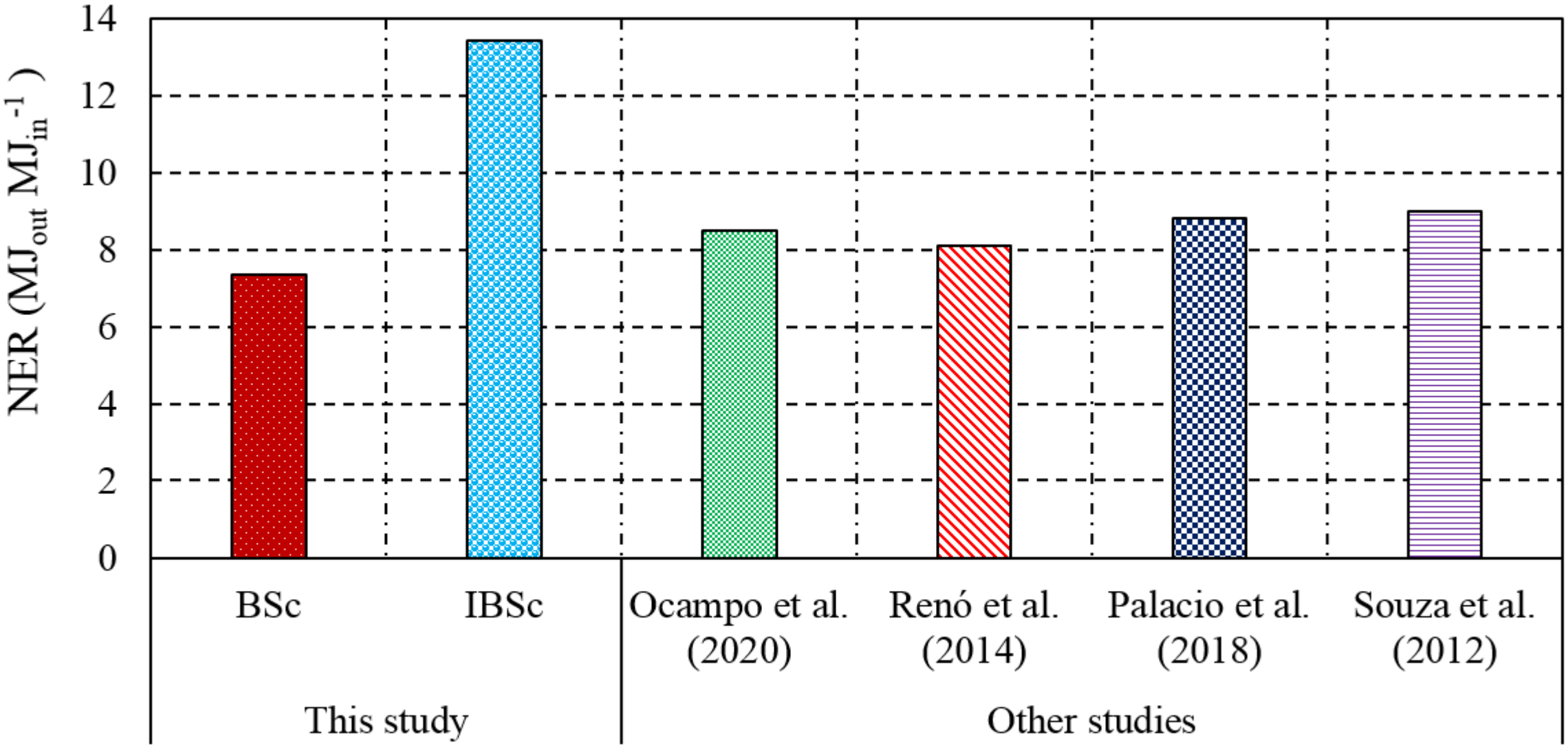


Figure 3.12: Comparison of the NER obtained with others reported in the literature.

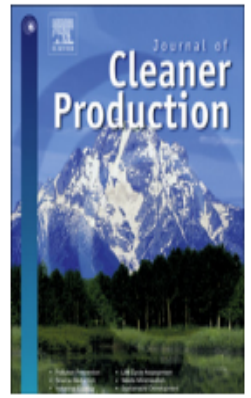
Algunos detalles adicionales:
Cual tecnologia de generacion utilizar??

Journal of Cleaner Production 295 (2021) 126426

Contents lists available at ScienceDirect

Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro



Evaluation of the maturity level of biomass electricity generation technologies using the technology readiness level criteria

Fernando Bruno Dovichi Filho [a], York Castillo Santiago [c], Electo Eduardo Silva Lora [a, *], José Carlos Escobar Palacio [a], Oscar Agustin Almazan del Olmo [b]

Technology and market maturity of biomass electricity generation technologies

Table 3: Weighted TRLs for evaluated technologies.

Technology	Weighted TRL	Maturity Level	Percentage of experts that declared not to be aware of evaluated technology ()
Conventional Rankine cycle	7.76	High	1.09
BIGCC-Biomass integrated gasifier combined cycle	6.28	Medium	8.91
Organic Rankine Cycle (ORC)	7.09	High	1.98
Externally fired gas turbine (EFGT)	6.39	Medium	5.94
Steam radial turbines	6.51	Medium	17.82
Piston steam engines	7.00	High	15.84
Screw expanders	6.21	Medium	23.76
Stirling engines	6.20	Medium	7.92
Gasification/internal combustion engine (G/ICE) systems	6.71	Medium	2.97
Gasifier / Gas microturbine	5.98	Medium to high	8.91

CONCLUSIONS

- Results show 54,35 % of respondents consider CRC technology already has a high degree of maturity, with TRL 9 readiness level, and 35,64 of experts consider ORC technology also has a TRL 9. Related to the weighted TRLs, it was observed CRC technology reached a weighted TRL of 7,76, while ORC systems had a weighted TRL with value 7,09. Concerning Radial Steam Turbine, Piston Steam Engines, and Screw Expander technologies concentrate highest number of specialists who were not aware of them.

- Among technologies included in the research, it is clear CRC technology is most explored, disseminated, and commercialized in the world, with highest degree of maturity. Although, technologies such as ORC soon should reach the highest level of maturity due to hundreds of new installations being or planned to be installed around the world. TRL definition for G/ICE technology resulted to be a complex task as reflected in present survey´s results, where the weighted TRL is 6,71. This due to the occurrence of different maturity levels in operational existing units.

Algunos detalles adicionales:
Hay tierras disponibles en el mundo para bioenergia??

ELSEVIER

Land Use Policy

Volume 105, June 2021, 105346

Global potential assessment of available land for bioenergy projects in 2050 within food security limits

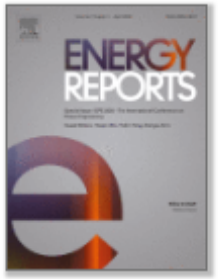
Tomás Andrade da Cunha Dias [a], Electo Eduardo Silva Lora [a], Diego Mauricio Yepes Maya [a], Oscar Almazán del Olmo [b, 1]

Algunos detalles adicionales:
Como anda la bioenergia en Brasil?

ELSEVIER

Energy Reports

Volume 7, November 2021, Pages 2574-2587



Research paper

Theoretical and technical assessment of agroforestry residue potential for electricity generation in Brazil towards 2050

Lidiane La Picirelli de Souza [a] ✉, Sara Rajabi Hamedani [b] ✉, Electo Eduardo Silva Lora [a] ✉, Josè Carlos Escobar Palacio [a], Gabriele Comodi [c], Mauro Villarini [b] ✉, Andrea Colantoni

Continuamos andando...

Electo Eduardo Silva Lora, Mateus Henrique Rocha, José Carlos Escobar Palacio, Osvaldo José Venturini, Maria Luiza Grillo Renó and Oscar Almazán del Olmo

The sugar and alcohol industry in the biofuels and cogeneration era: a paradigm change (part I)

Paper presented at the XXVIII Congress of the International Society of Sugar Cane Technologists, Sao Paulo, Brazil, 24–27 June 2013 and published here with the agreement of the Society.

Sugar Industry 139 (2014) No. 1 | 28–36

THANKS A LOT, MUITO OBRIGADO

electo@unifei.edu.br

silva.electo52@gmail.com