

Scaling of sustainable technologies to transform GLYCEROL into added-value and energetic compounds

Raúl A. Comelli ^a, Lisandro Ferrari ^{a,b}, Fernando Tuler ^a, Carlos Casas ^b, Diego García Touza ^b.

^a Instituto de Investigaciones en Catálisis y Petroquímica "José Miguel Parera" – INCAPE (UNL, CONICET). Santa Fe, Argentine. ^b VARTECO QUÍMICA PUNTANA S.A. Villa Lynch (Province of Buenos Aires), Argentine.

1. Introduction

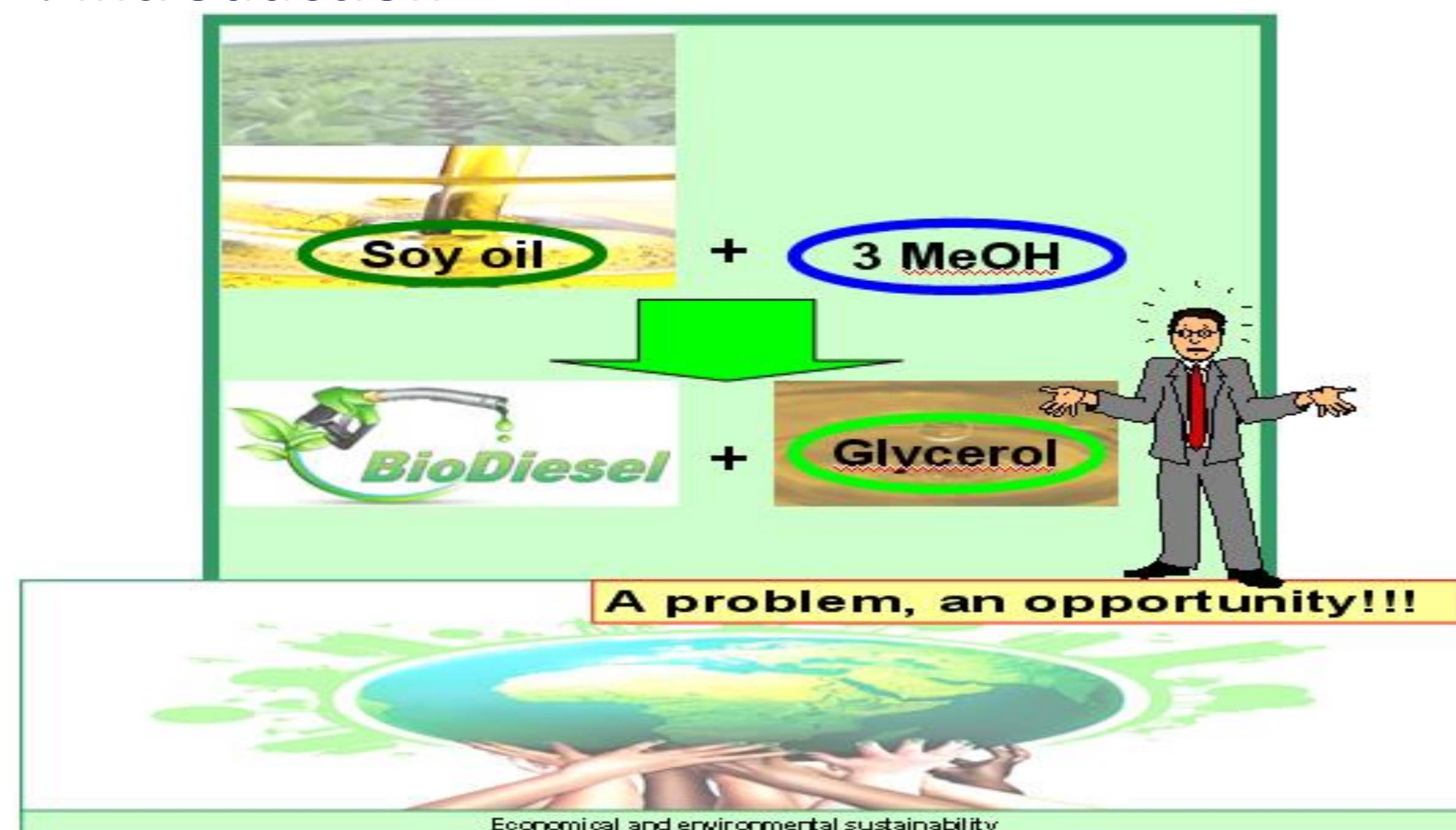


Figure 1. Biodiesel industry: GLYCEROL the co-product.

The problem is not resolved adopting a monoproduct strategy; solution must have a diversification approach and the concept of Biorefinery can be applied [1].

2. Experimental

Catalysts for each studied process were selected or designed, prepared, characterized, and their catalytic performance evaluated. Conditions of each steps were previously reported [1].

3. Results and discussion

Since 2007, catalytic processes are developed to convert glycerol into compounds with high added-value as well as compounds with energetic use (Fig. 3).

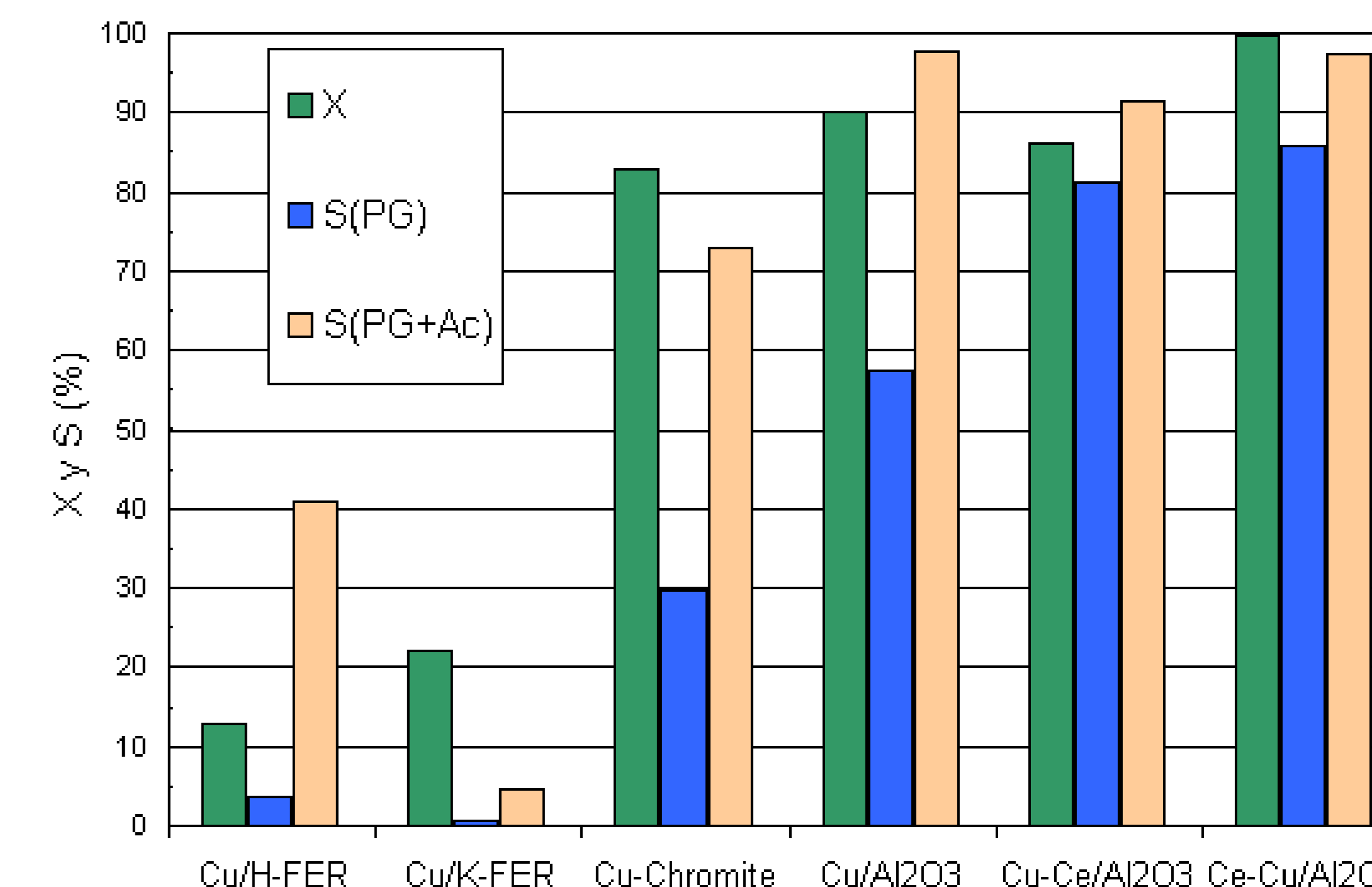


Figure 4. Glycerol to PG: conversion (X) and selectivities (S).

4. Conclusion

A strong link between both I&D and productive sector allowed to obtain financing to build two pilot plants: 1) one to produce 100 tn/year of PG but versatile to also produce acetol and/or EG, and 2) another one for glycerol steam reforming to obtain hydrogen, raw material for selective reductions.

Acknowledgments

Financial assistance of UNL, CONICET, FONARSEC (Project 004-Biorefineries), and ASaCTel (Proj. IP-2016-020) is acknowledged.

References

- R.A. Comelli. Glycerol, the Co-Product of Biodiesel: One key for the Future Bio-Refinery, in: G. Montero, M. Stoytcheva (Eds), Biodiesel – Quality, Emissions and By-Products, Intech Open Access Publisher, Croatia, 2011, pp. 257-282.
- R.A. Comelli and S. Antuña. Argentine Patent AR078267B1 (2016).
- R.A. Comelli and L.R. Ferrari. European Patent EP3235566 (2019). US Patent 0344957 A1 (2020). Brasil Patent BR 112017012993-0 (2021).
- R.A. Comelli and F.E. Tuler. Argentine Patent P20180103864 (2018).

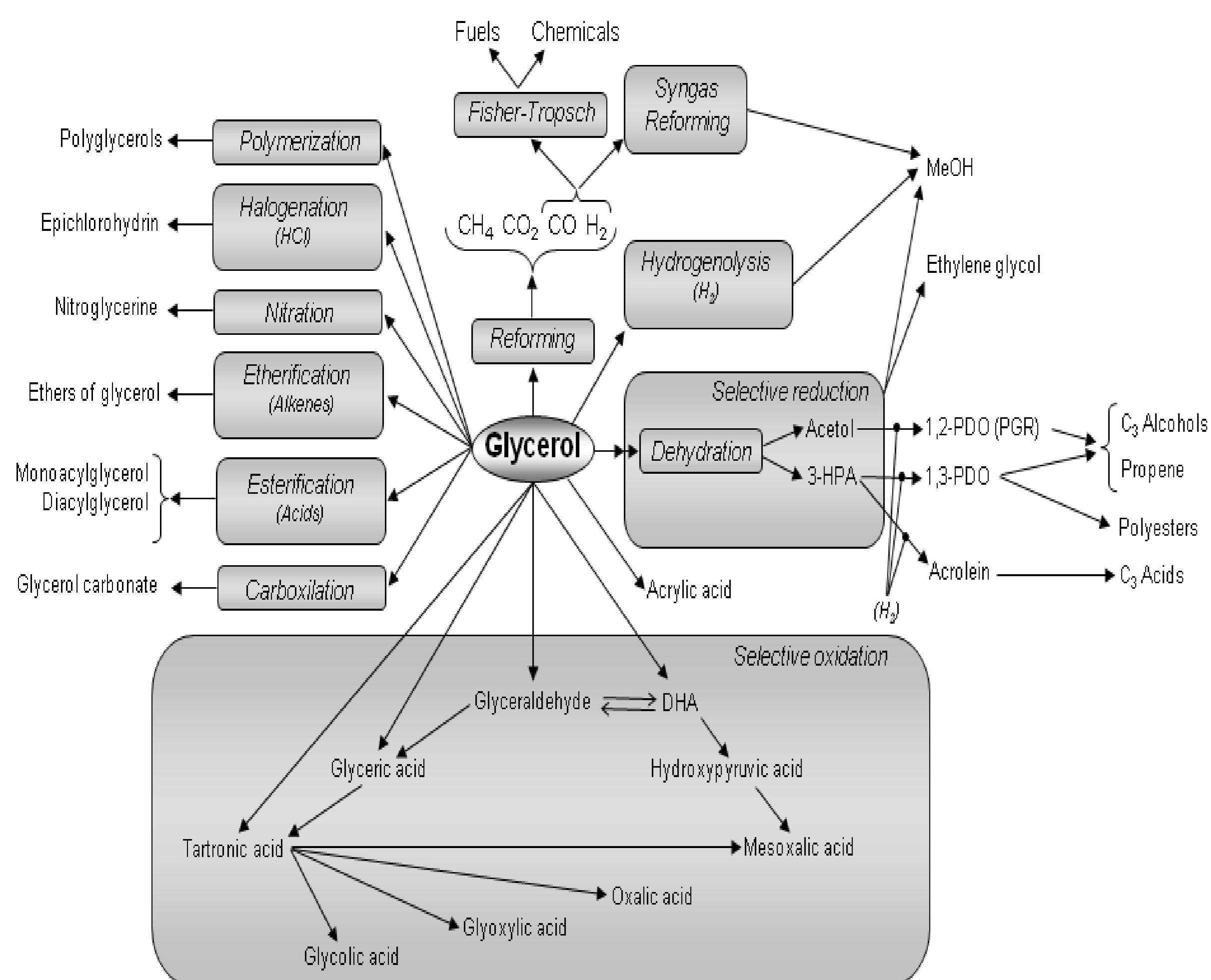


Figure 2. Possible reactions of GLYCEROL.

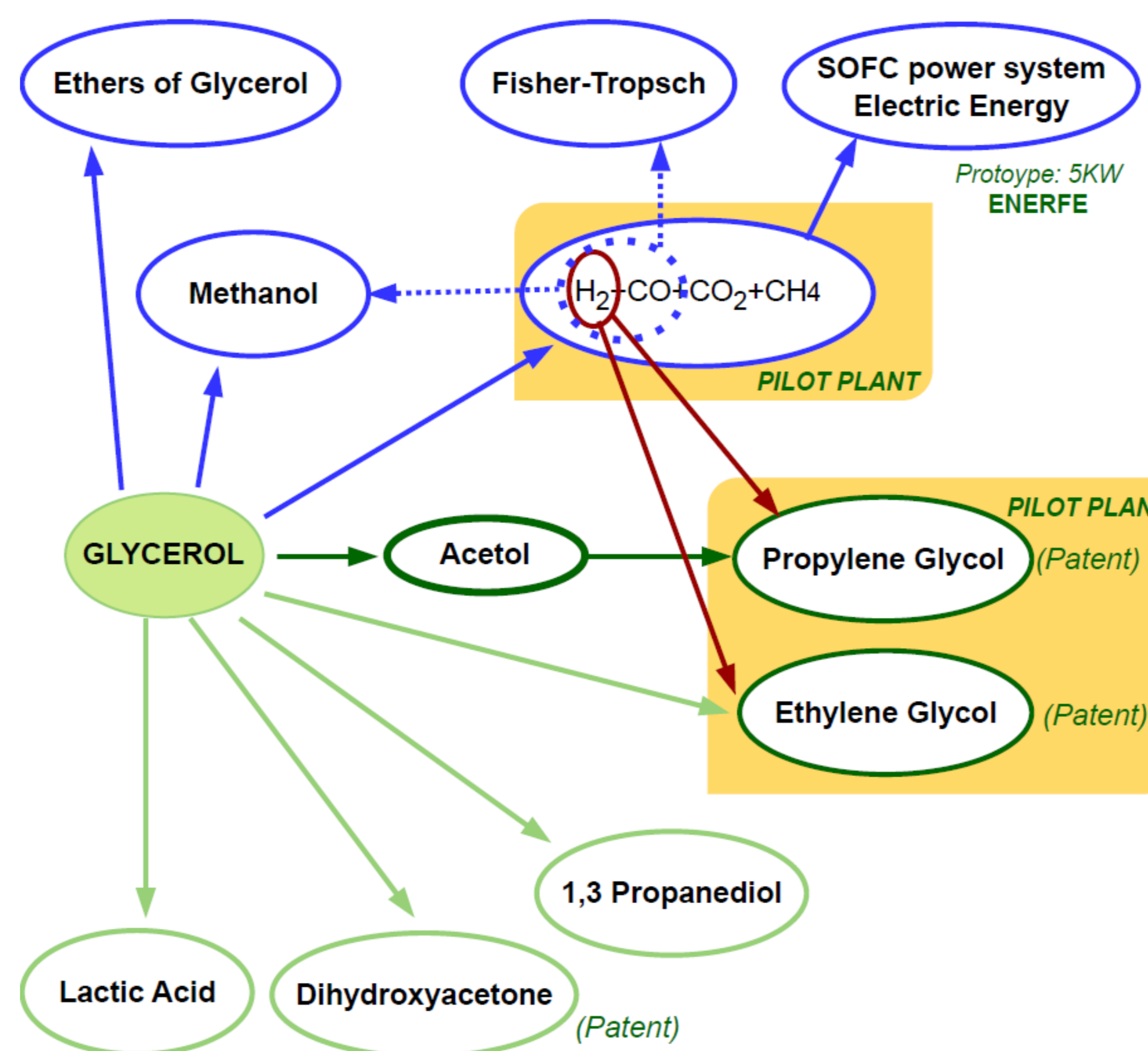


Figure 3. Biorefinery of GLYCEROL. Studied processes in laboratory scale