

# LCA of a fuel cell using gold for the bipolar plates

**Saïcha Gerbinet<sup>1</sup>**, A.-P. Romano<sup>2</sup>, Giuseppe Caldarella<sup>1</sup>,  
Nathalie Job<sup>1</sup>, Sylvie Groslambert<sup>1</sup>, Angélique Léonard<sup>1</sup>

Saïcha.gerbinet@uliege.be

<sup>1</sup>Department of Chemical Engineering

Université de Liège

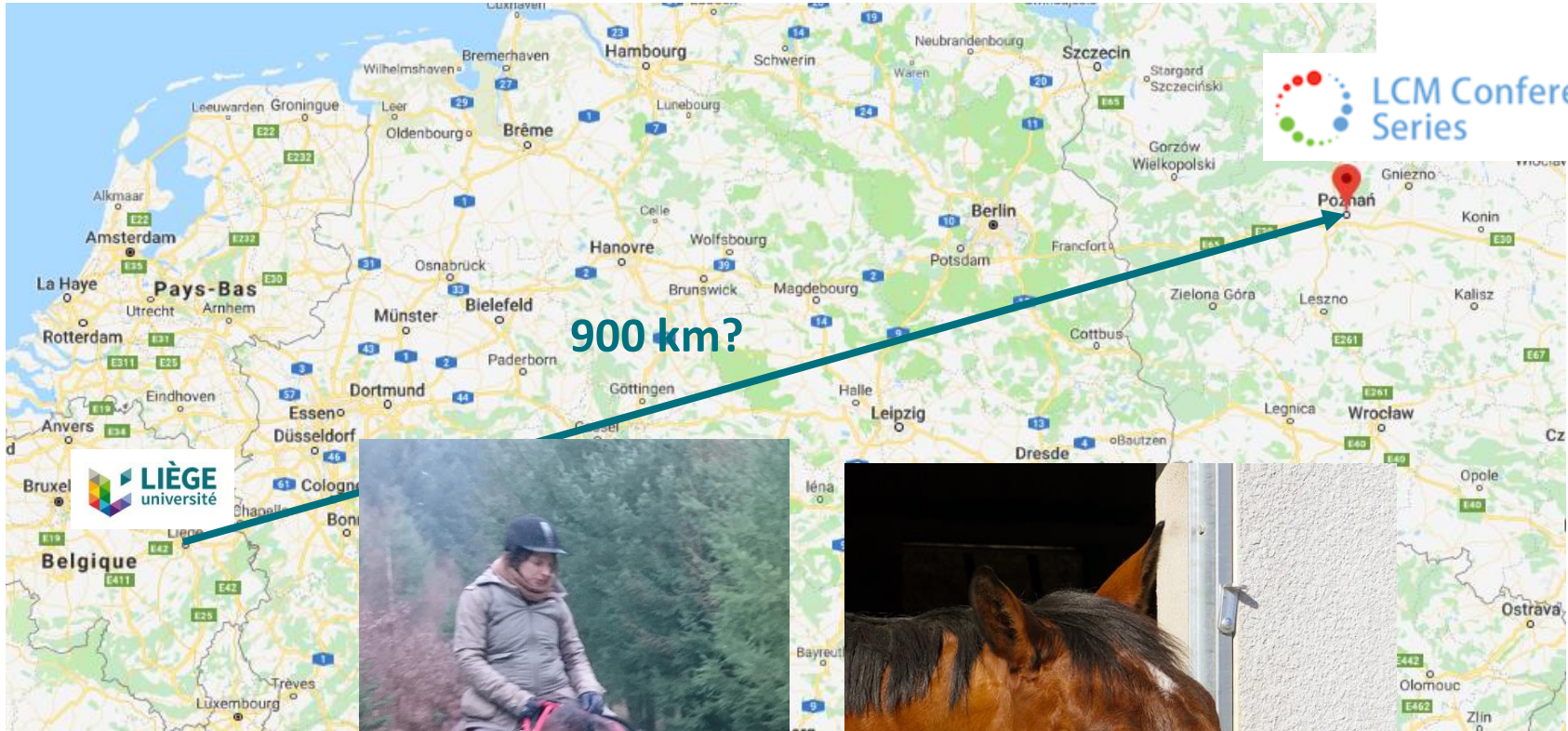
<http://chemeng.uliege.be>

<sup>2</sup>Materia Nova Research Center



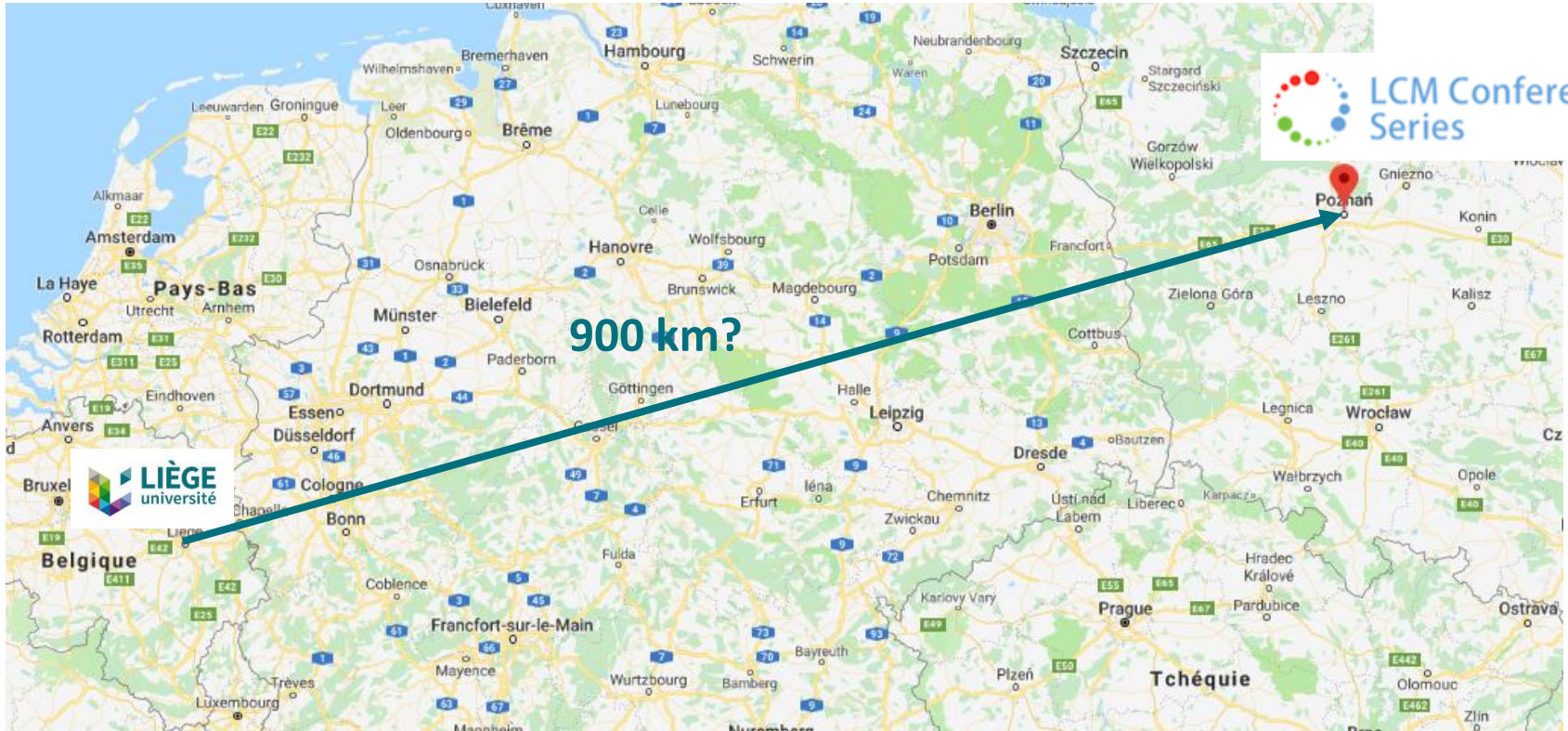


2 solutions



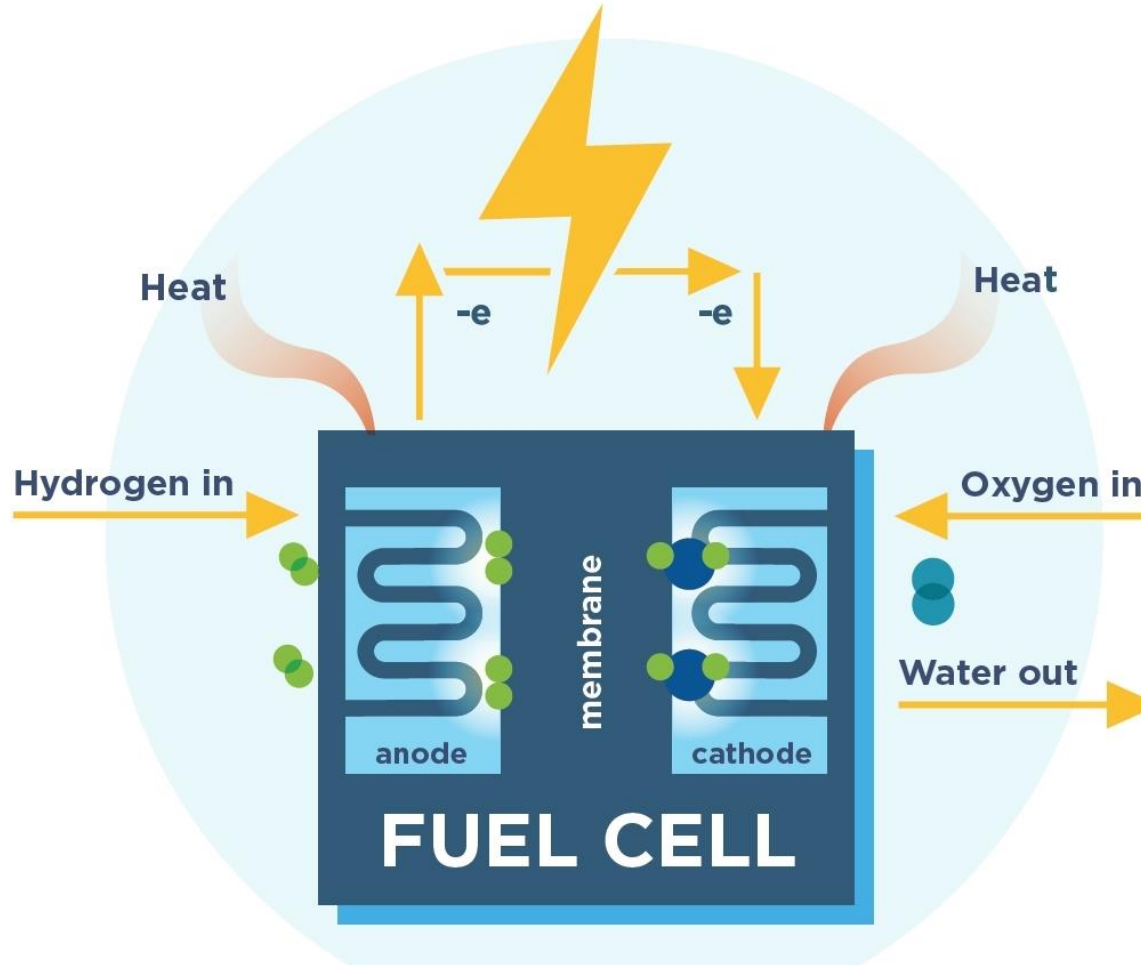
Solution 1:





## Solution 2:

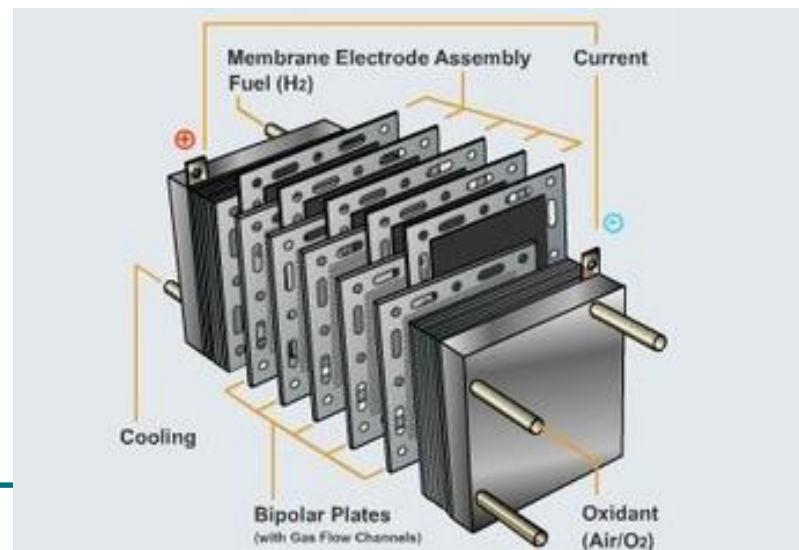
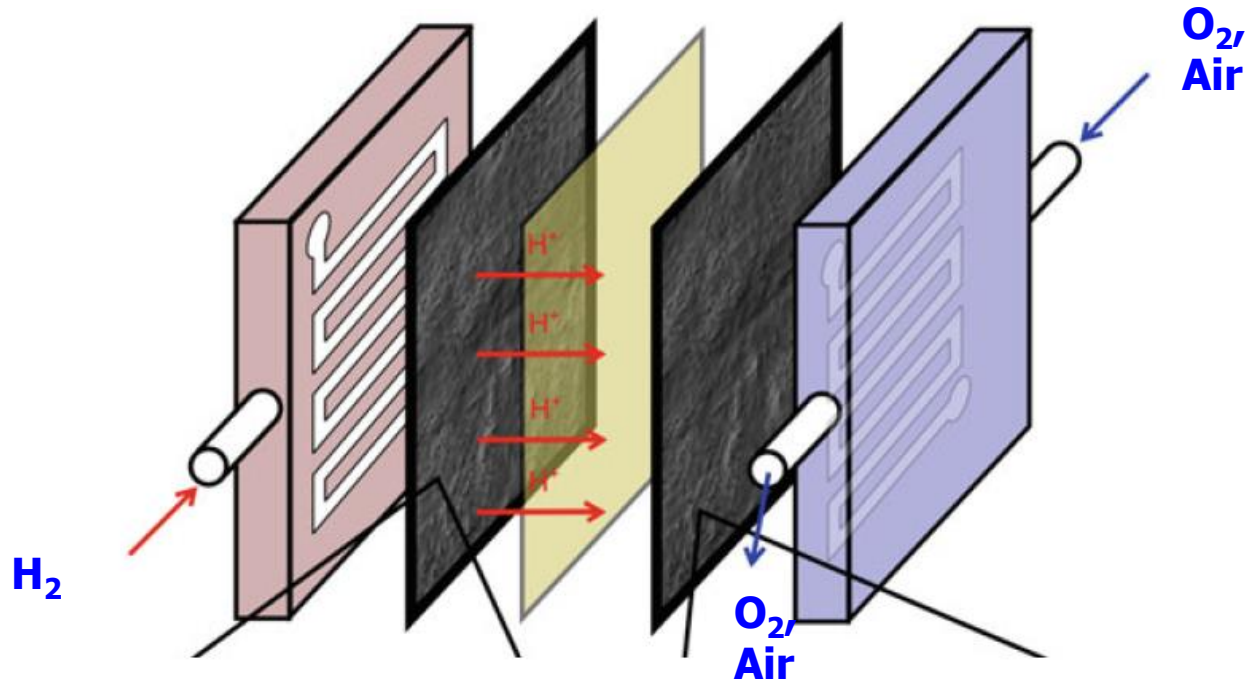


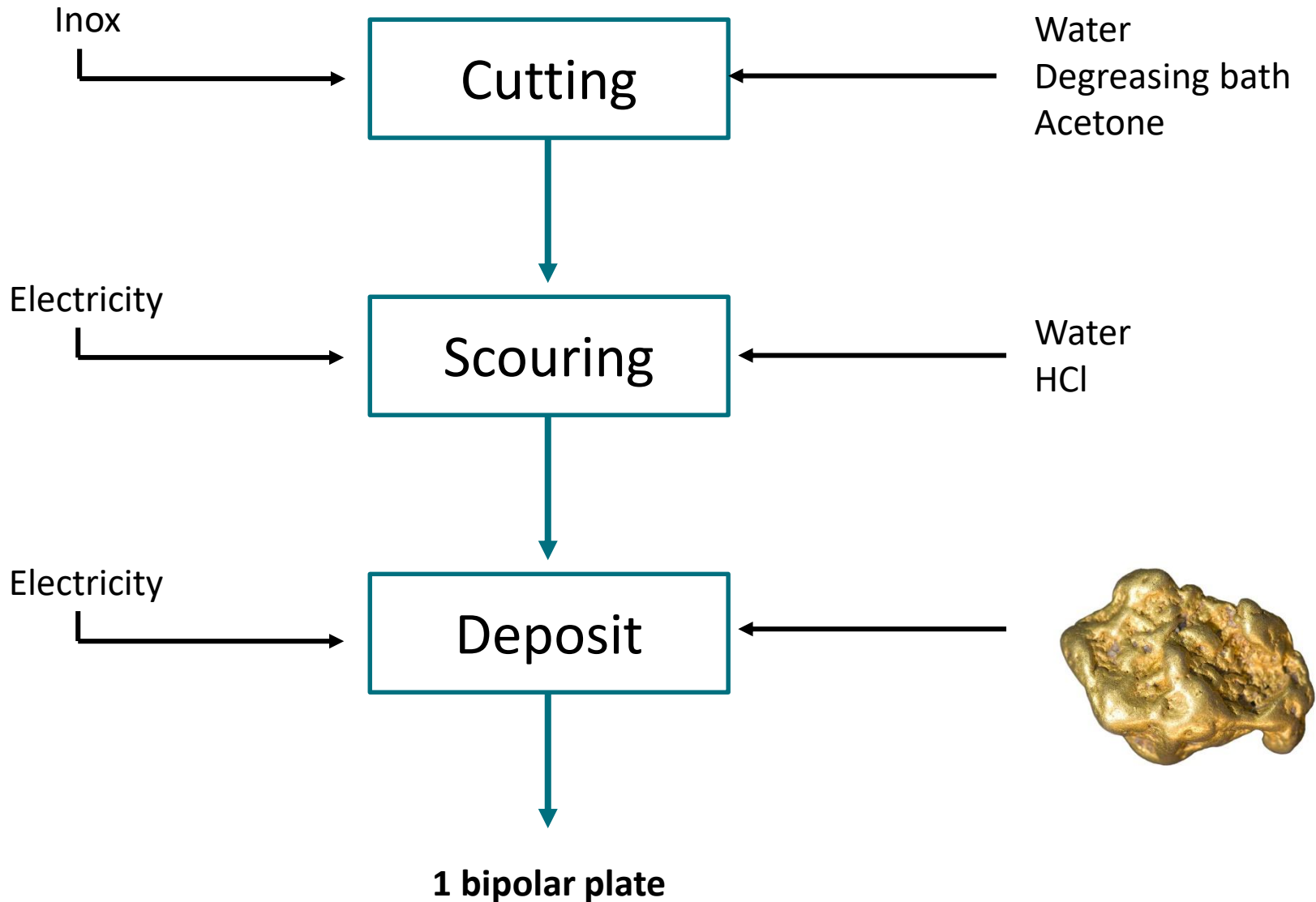


- ▶ Optimize lifetime and efficiency of materials for fuel cell
- ▶ Environmental impact

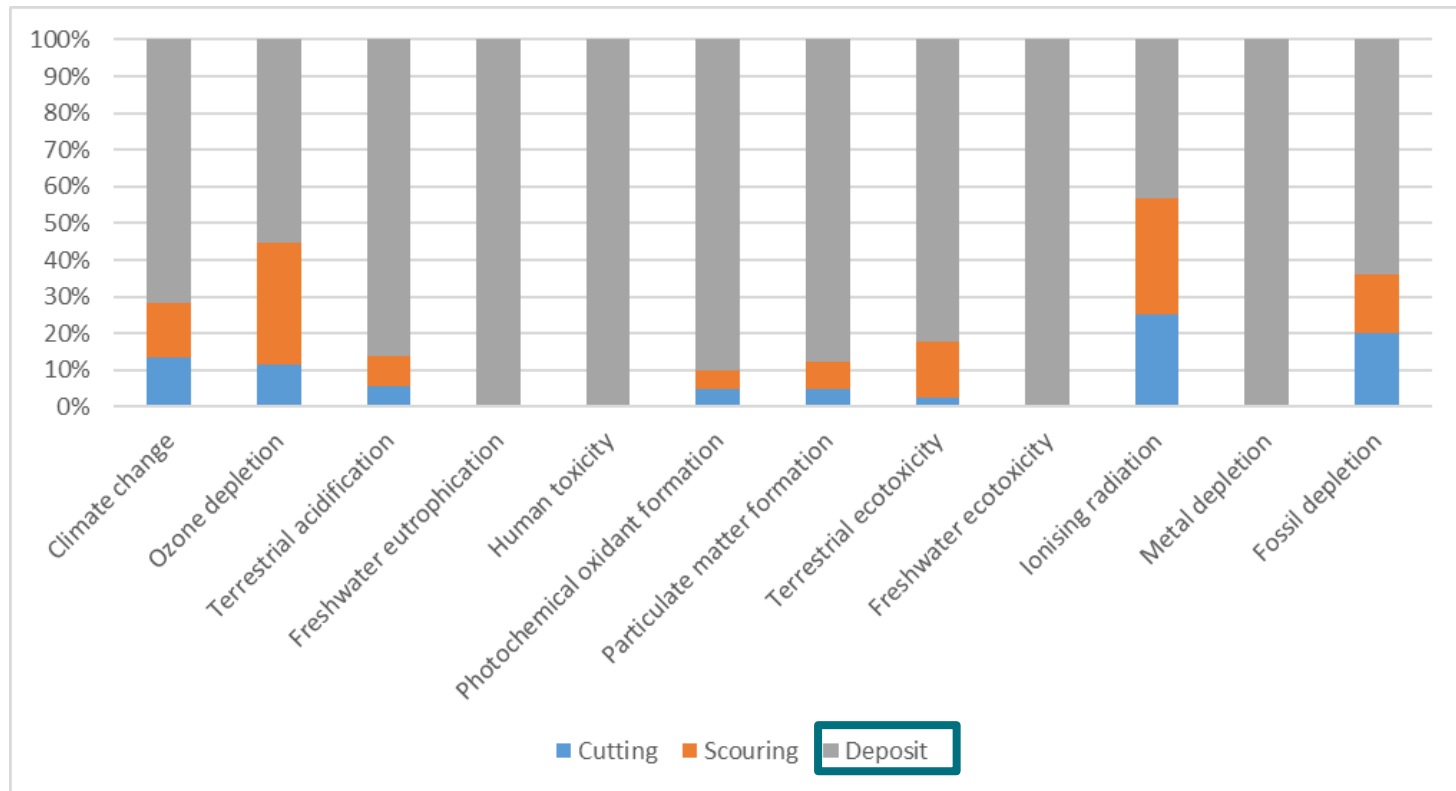


# Bipolar plates

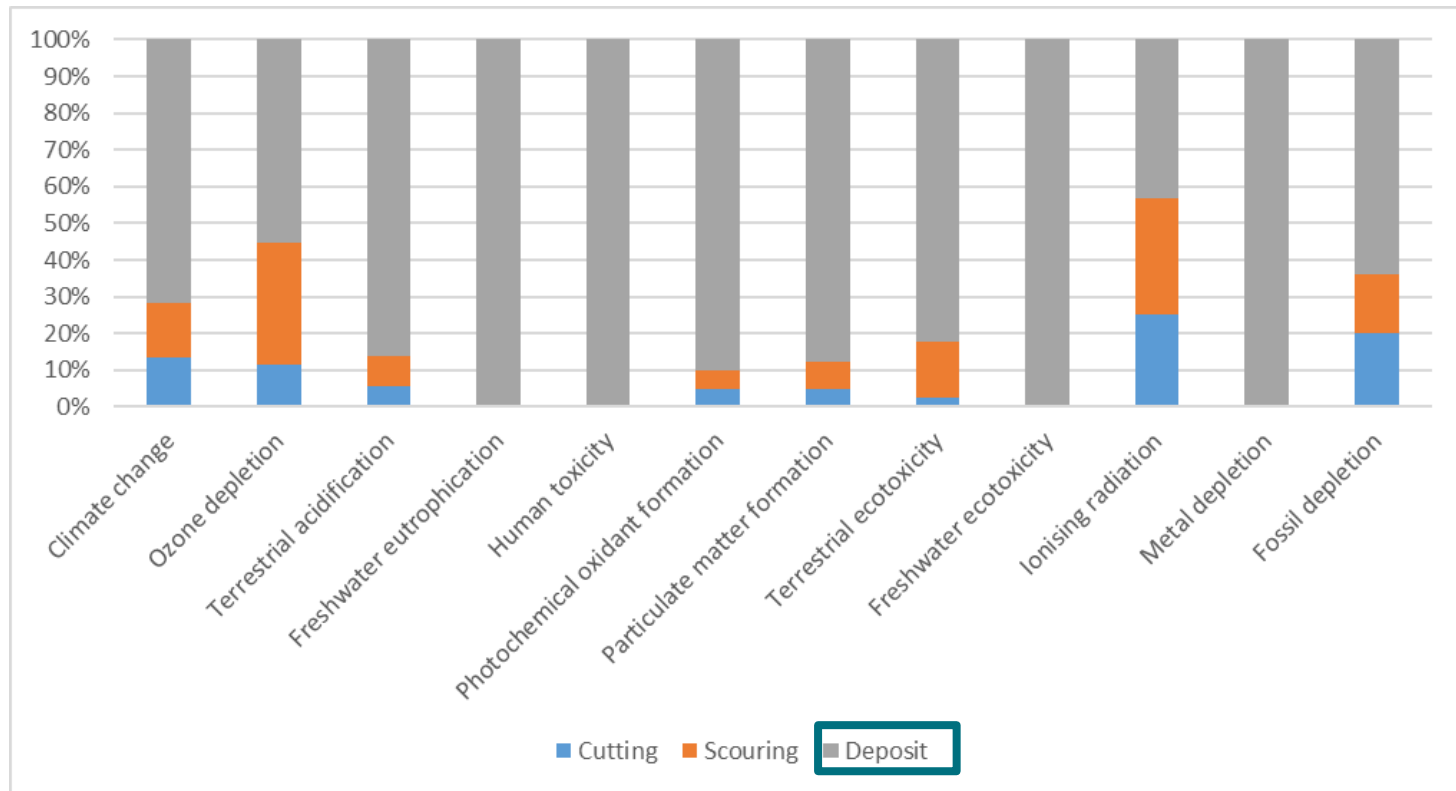






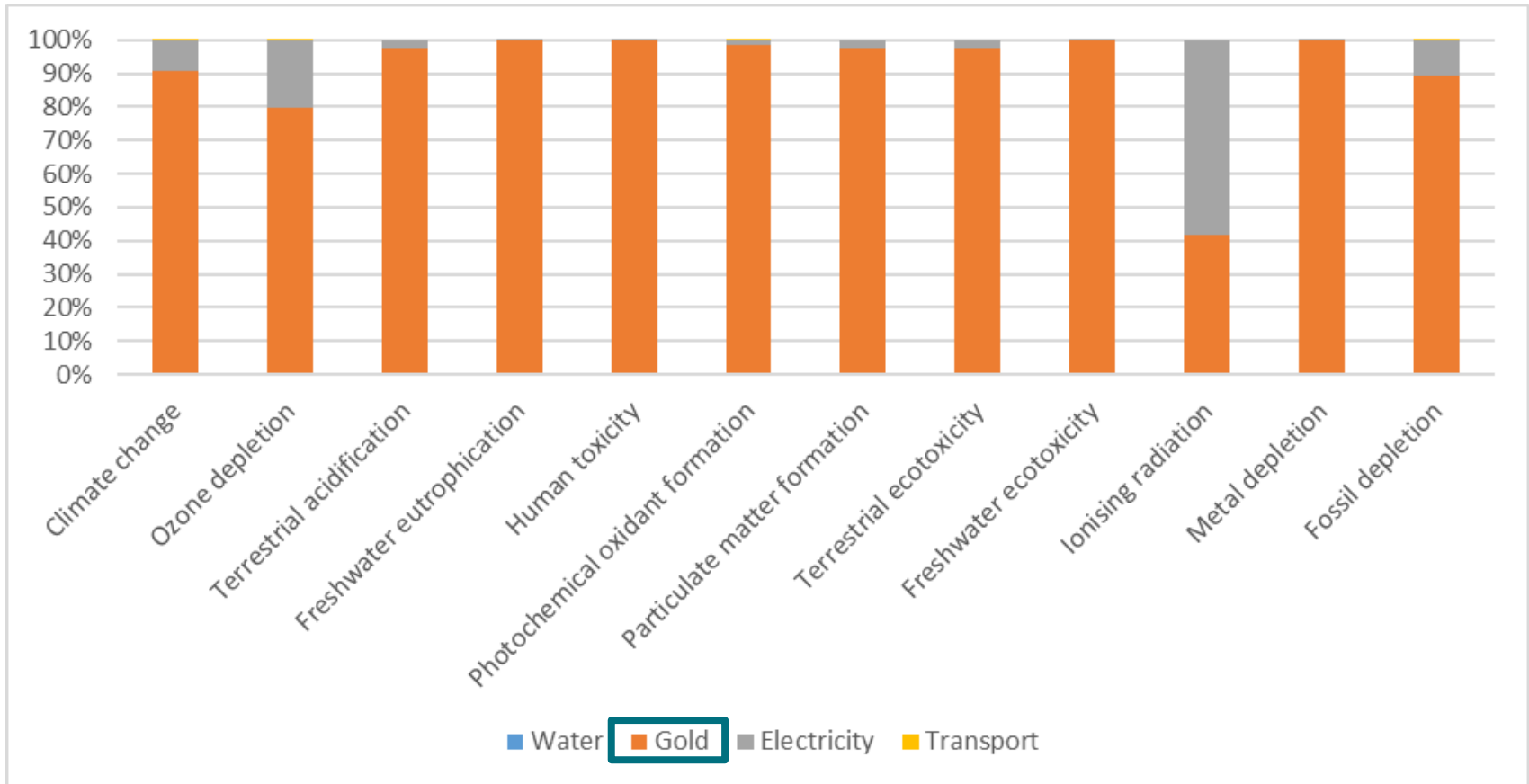


ReCiPe MidPoint (H)



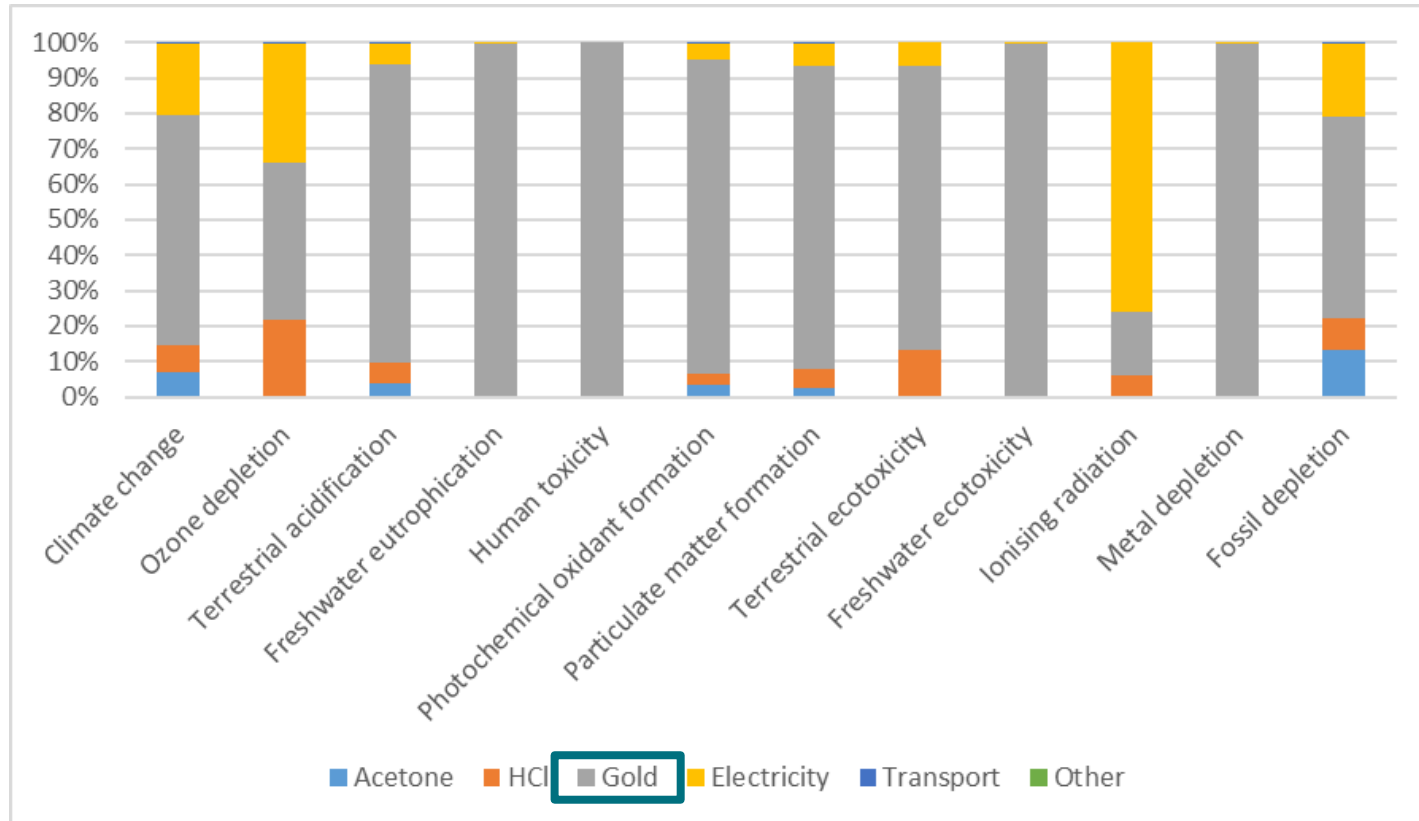
ReCiPe MidPoint (H)

# Deposit?



ReCiPe MidPoint (H)

# Gold in the whole bipolar plate?



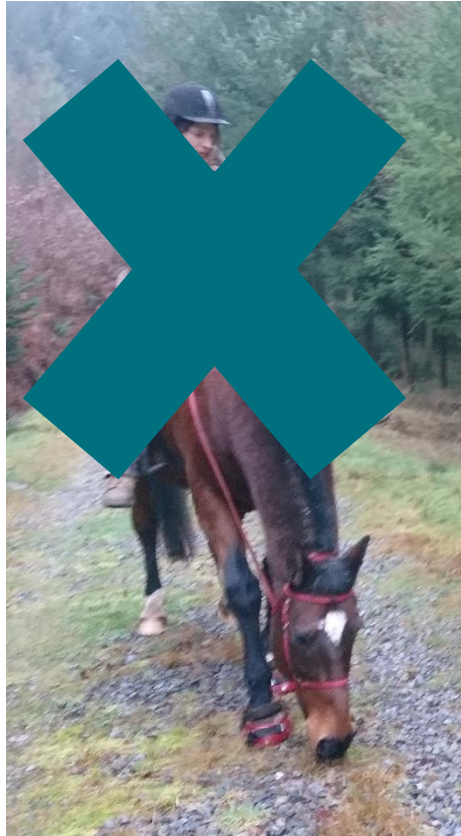
ReCiPe MidPoint (H)

# Reduce the impact of gold?

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- ▶ 2 solutions !

**Solution 1:**

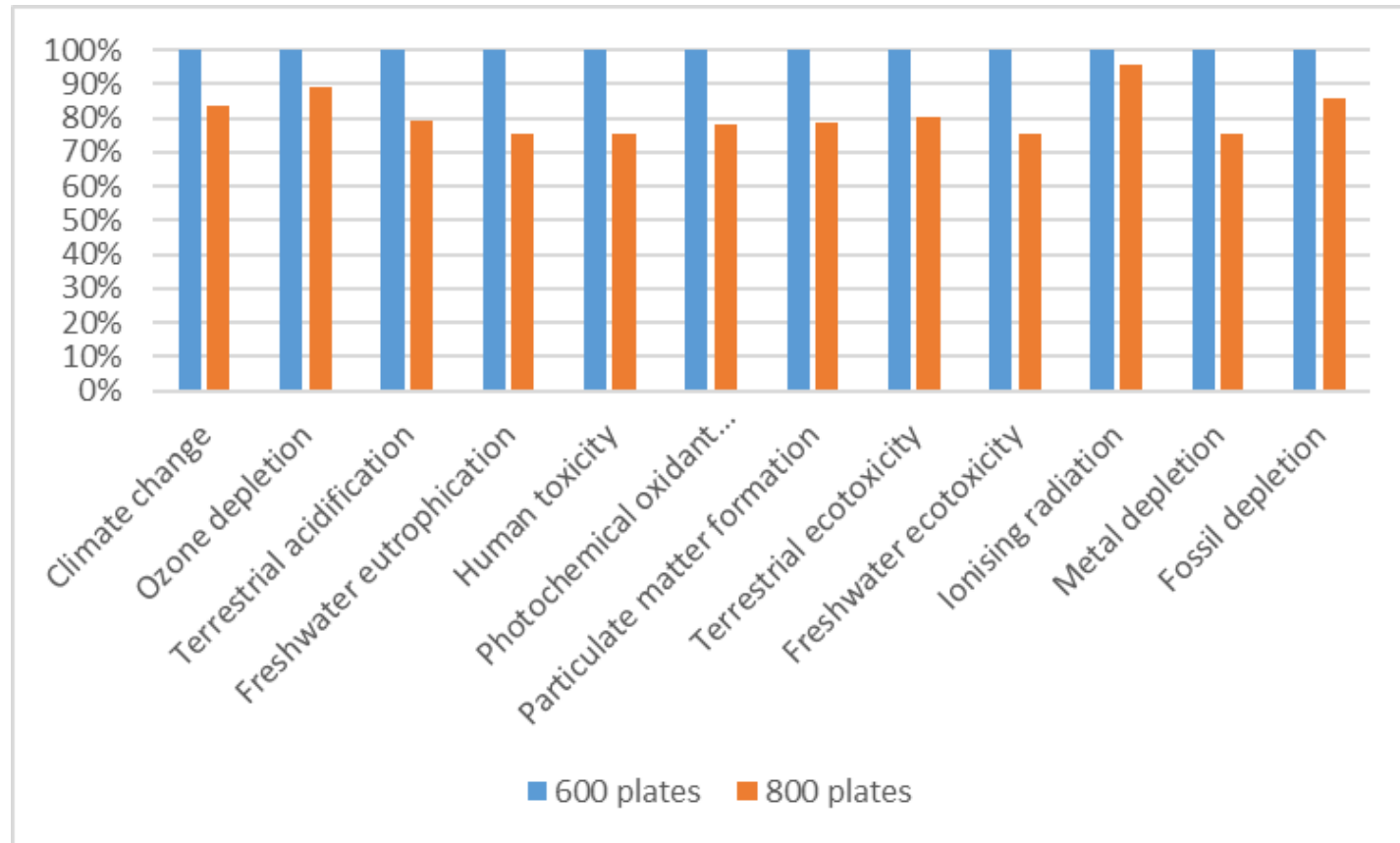


# Reduce the impact of gold?

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- ▶ 2 solutions !
  - ▶ Optimize the bath use
  - ▶ Use recycled gold

# Number of plates per bath?

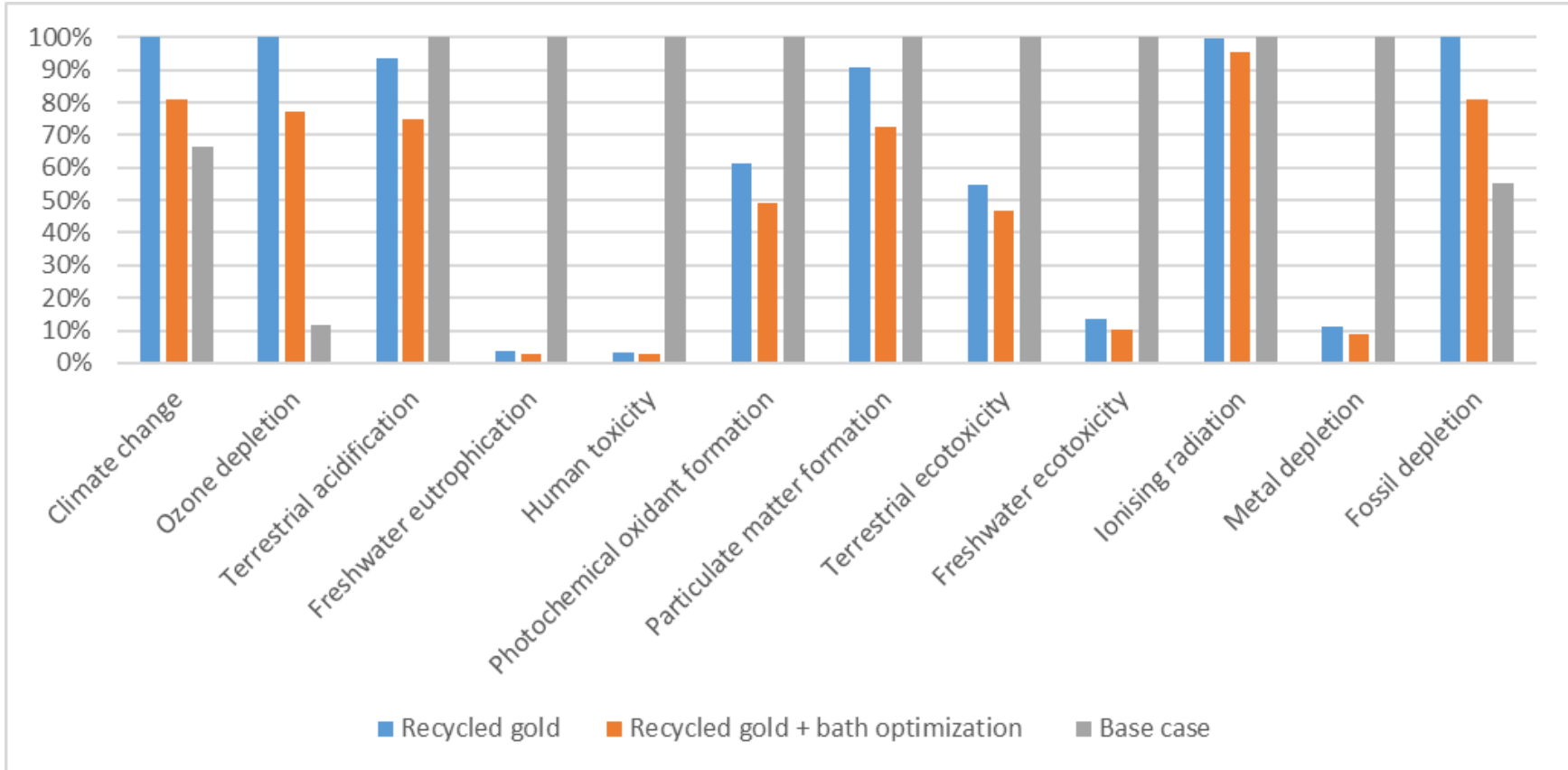


ReCiPe MidPoint (H)

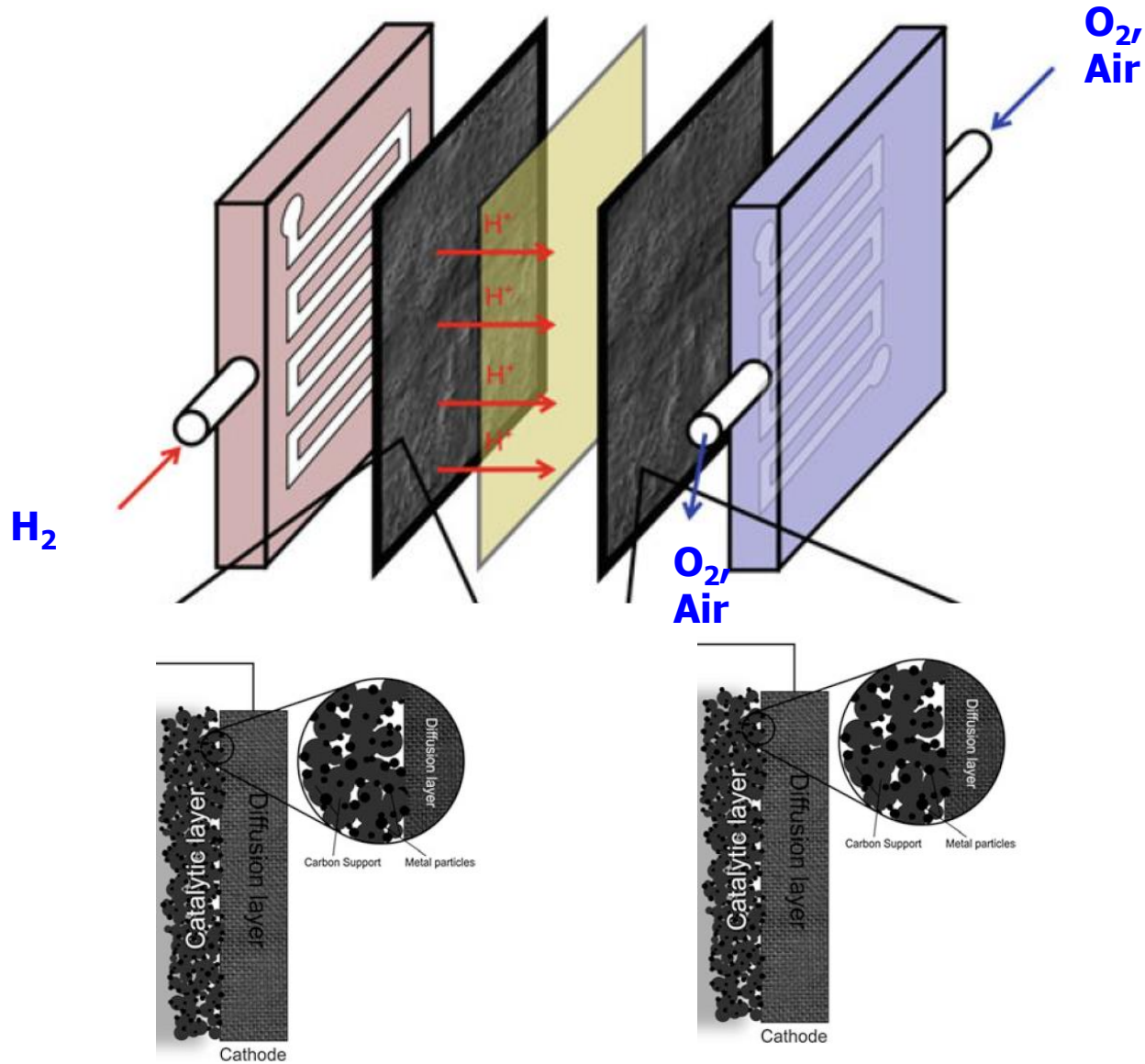
- ▶ Difficulty to find reliable information
  - ▶ Bibliographic studies
  - ▶ Use of: « Gold treatment of precious metal from electronics scrap, in anode slime, precious metal extraction | Alloc Def, U »



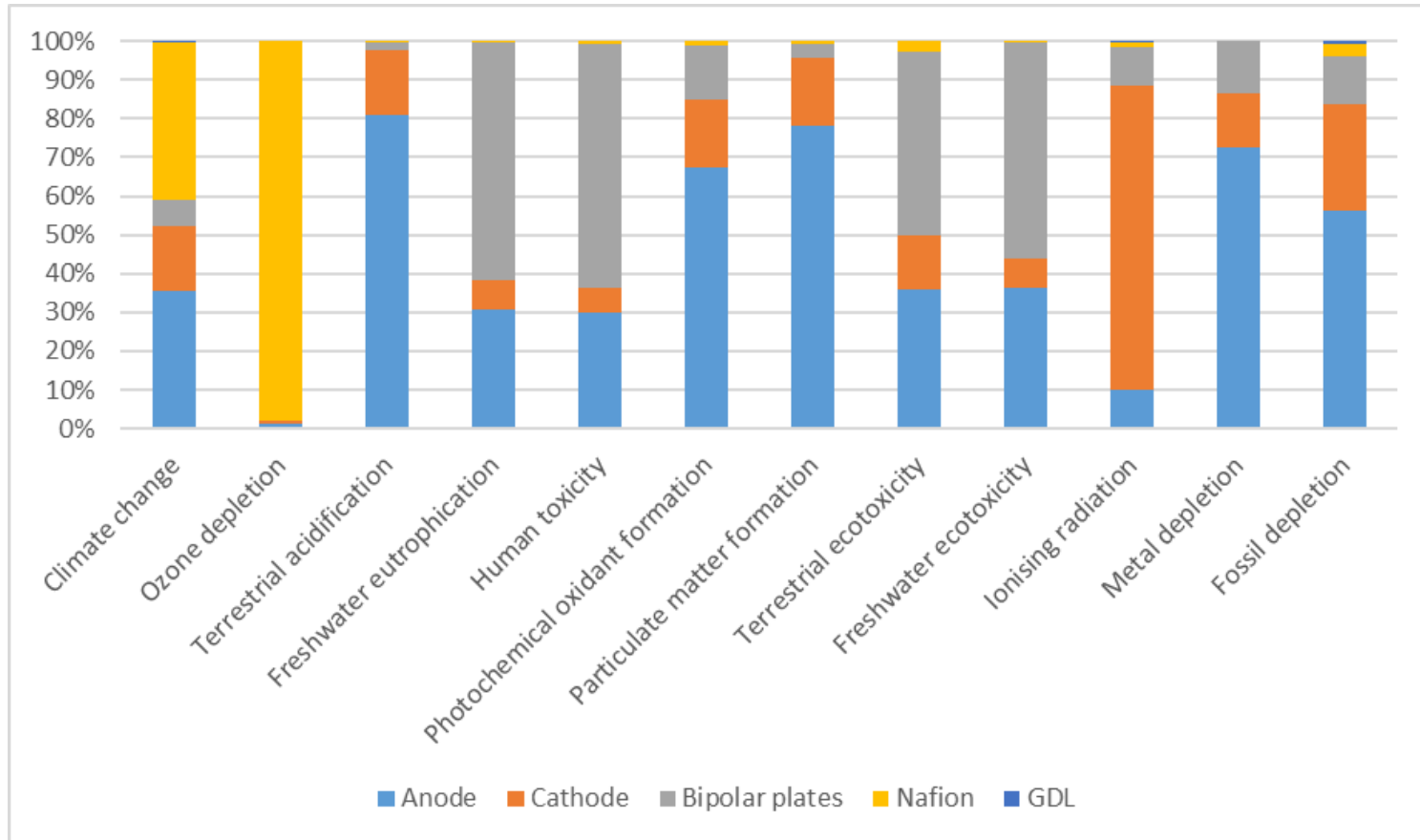
# Recycled gold



# In the fuel cell?

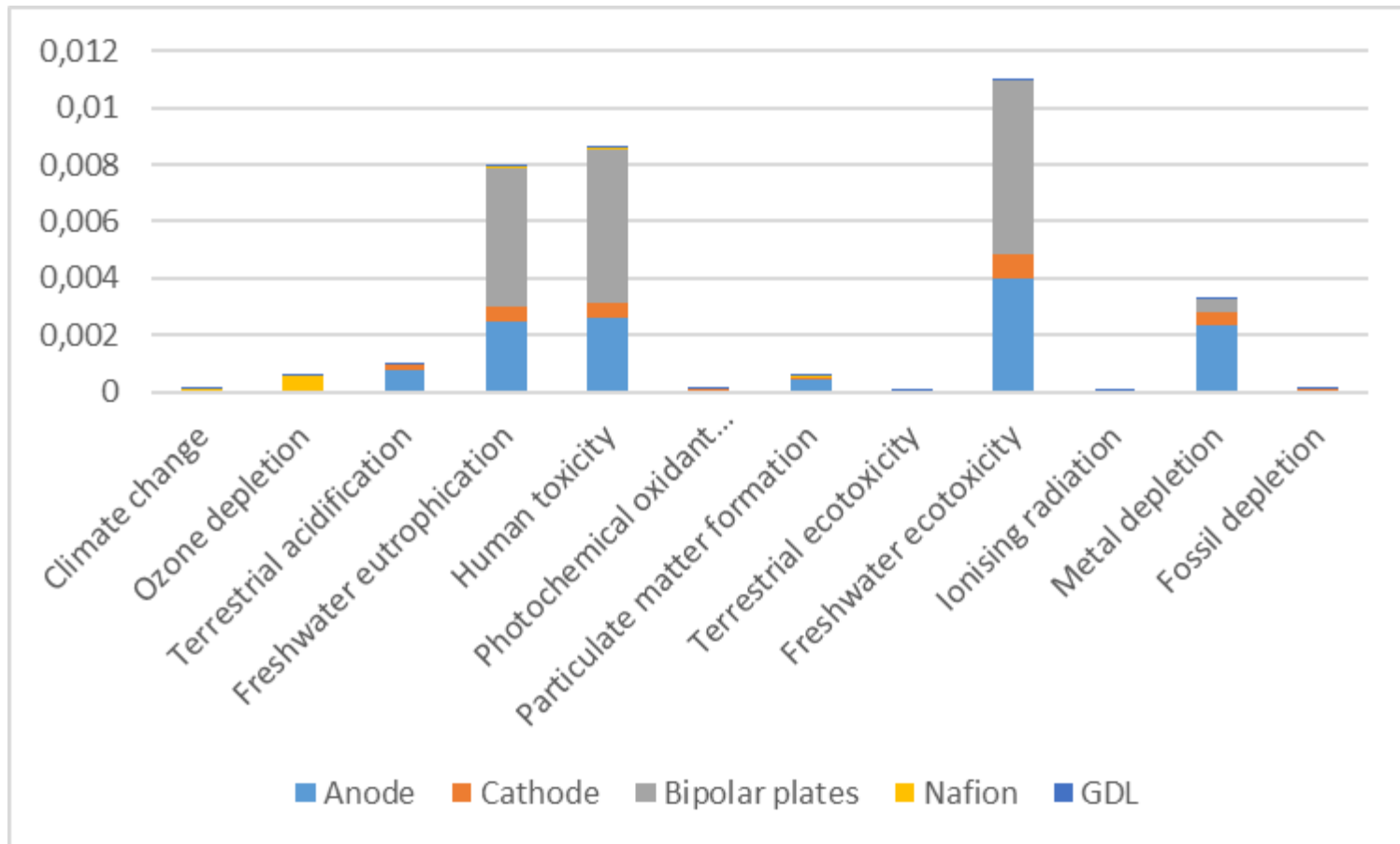


# In the fuel cell?

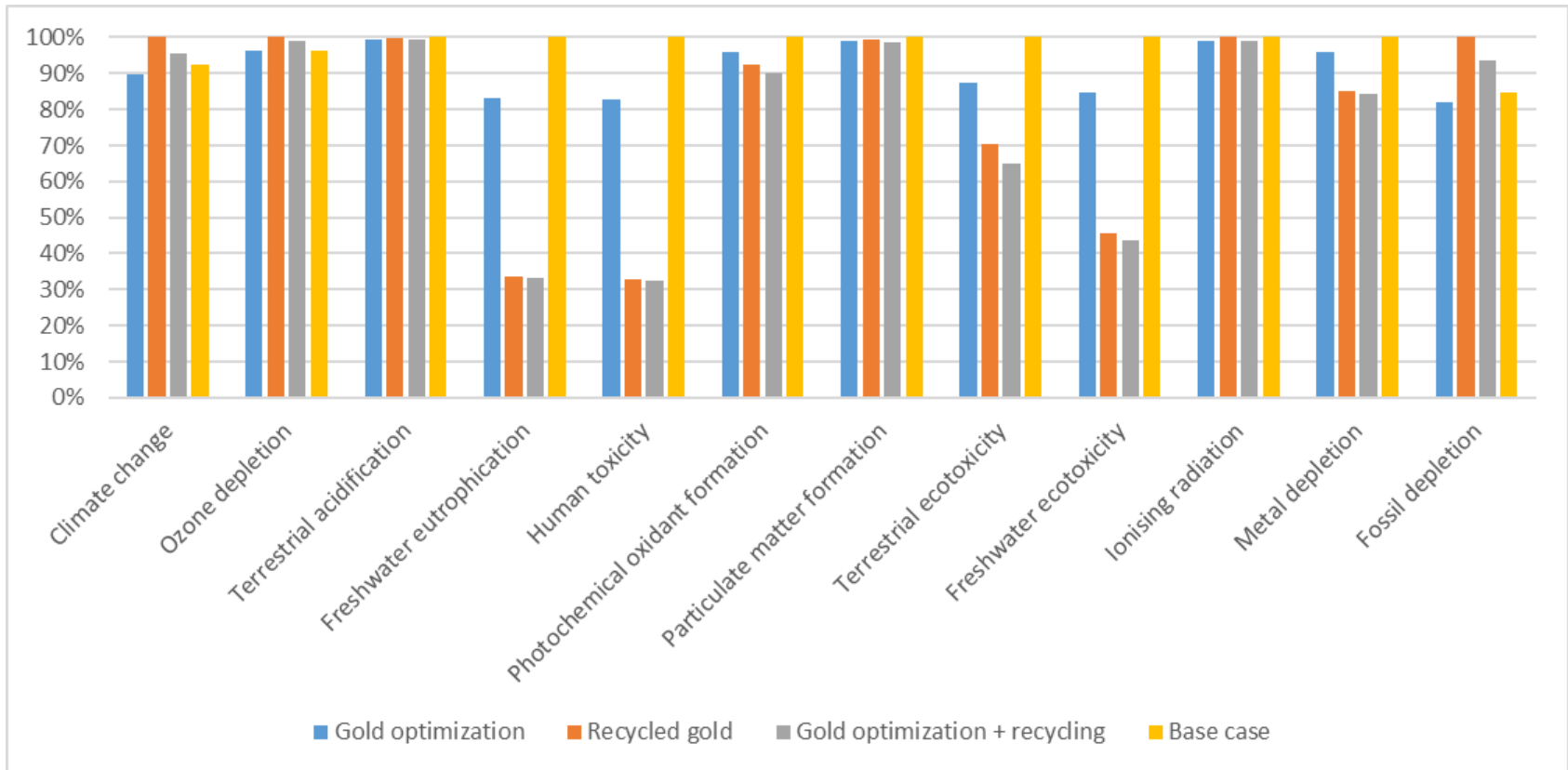


ReCiPe MidPoint (H)

# In the fuel cell?

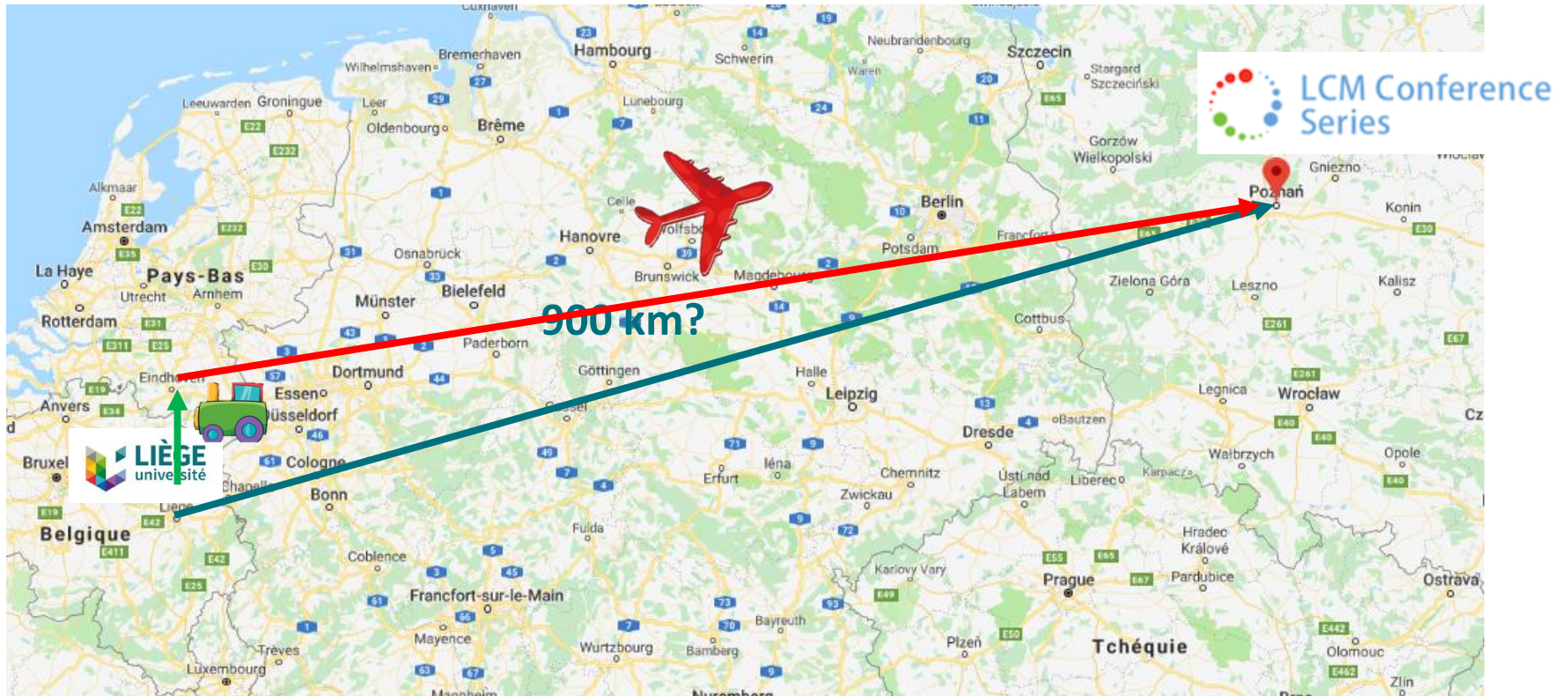


ReCiPe MidPoint (H)



ReCiPe MidPoint (H)

# Conclusion



- ▶ Large contribution of gold
  - ▶ Does the performance improvement justify the use of precious metal?
- ▶ Recycling ?
  - ▶ Lack of data
  - ▶ Not always an improvement of environmental impact
  - ▶ Availability?
  - ▶ Design to allow recycling?