



UNIVERSITÀ DEGLI STUDI DI MILANO

Women and energy communities The case of *ènostra* in Italy

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Contribution of our research project

- Assessing the role of women and their views in energy communities, still understudied in the literature, despite the fact that energy is a male-dominated field.
- Adopting a critical approach of the IAD (Brisbois 2019; Ostrom 2011; Brisbois 2019; F. D. Cleaver and De Koning 2015) to fill the gap in the literature showing how collective actions initiatives can address social inequality
- Achieving a better understanding of barriers that can hinder women's participation in the energy transition, and how it is possible to foster it (Clancy 2017)
- Putting an emphasis on gender dynamics in energy communities to better understand which direction is going to take the energetic transition (Agrawal, 003; Allen 2019)



The problem (1)

- The energy world is largely dominated by men: 78% of the technical posts in energy field are held by men, while women work usually in administrative positions with limited decision-making power (EIGE 2012; Pearl-Martinez 2015; Sustainlabour 2013).
 - This can be viewed as a consequence of the well-known gender imbalance in the enrolment and graduation in the STEM fields of study (Lindahl 2007; Kearney and YourLife 2017; UNESCO, 2017).
- However, participation in energy communities does not require specific (technical) skills, while being relevant *per se* on the social level, which should help to promote gender diversity (Łapniewska 2019) .
- Indeed, energy communities, considered as a form of collective action, have been strongly associated to the idea of energy democracy and energy justice, and thus inclusivity (Carrilho da Graça and Gomes 2016 ; Sovacool and Dworkin 2015 ; Stephens 2019; Strachan et al. 2015).



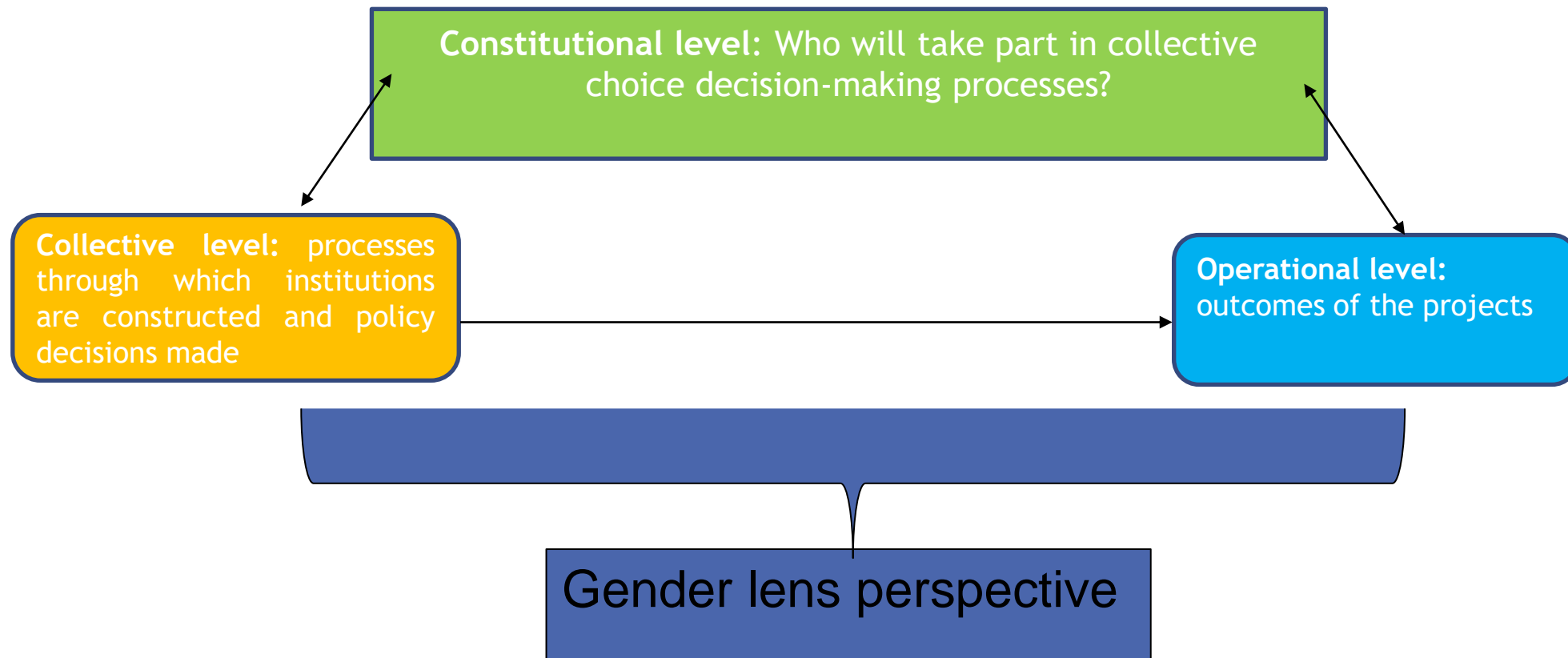
The problem (2)

- As a consequence and in principle, energy communities should welcome and foster women's participation in the energy world (Allen et al. 2019; Smith et al. 2016; Stephens 2019; Wyse and Hoicka 2019).
- However, this is far from being achieved, with women being largely underrepresented in energy communities (Fraune 2015; Łapniewska 2019), which raised some questions concerning women's inclusion in this field (Clancy et.al 2017; Fraune 2015; Łapniewska 2019; Lieu et.al 2020) as:

Why women are still underrepresented?
What hinders their representation?
Why is it important having women's perspective
in energy transition?
How can we foster their participation?

Theoretical framework

- To address this issue, we use the Ostrom' Institutional analysis and development framework (IAD) framework, while adding a critical perspective (Brisbois 2019; Greenwood et al. 2010; Berg Johansen and Waldorff 2015) by analysing through the gender lens (Pandolfelli et al 2007) how far collective actions initiative in the energy field have been inclusive towards women.

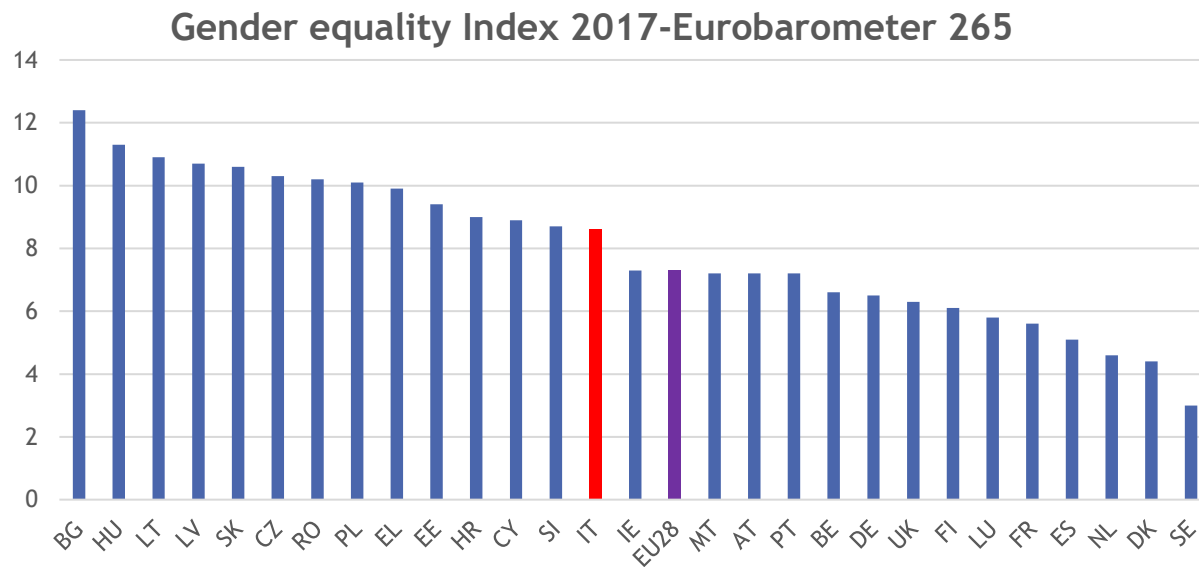


Main research questions

- RQ1: Which barriers hinder women's participation in energy communities? → Constitutional and collective level
- RQ2: Does it make any difference having women participating in the decision making process in energy communities? → Collective level
- RQ3: How can women in energy communities help fostering the energy transition in their family? → Operational level
- RQ4: Can role modelling help fostering the energy transition? → Constitutional/collective/ operational level

A case study

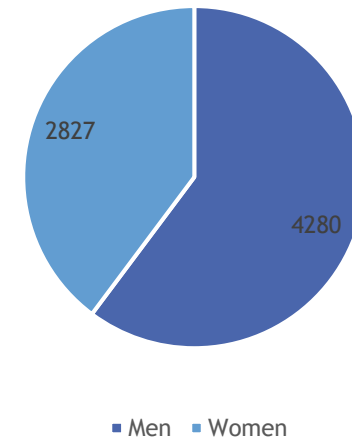
- Research on the Italian situation as regards energy communities is scarce, therefore choosing an Italian case study increases our knowledge in this field
- Italy is one of the most gender-stereotyped countries in European Union and can exacerbate the difficulties for women (Special Eurobarometer 465 2017)



A case study

- *ènostra*, being an Italian energy cooperative, has two interesting characteristics which help to better understand women's challenges in the energy communities field:
 - It is the biggest energy community in Italy: as of 31/12/2020, it has 7107 physical shareholders, where 4280 shareholders (60%) are men, 2827 are women (40%).
 - It is one of the few cooperatives in the European Union led by a woman, and the only one in Italy

Gender composition in *ènostra*



Data

- We ran an online survey among *ènostra* shareholders between the 28th October and 27th November
 - The survey was announced in the newsletter of October, that the cooperative sent to all shareholders whose email address was known (5638 mail addresses, 80% of the total shareholders). The survey was available for one month, with a recall.
 - 40% of the receivers (2255 over 5638) read the message with which the link to the survey was distributed
 - Since the email address belongs to the household member who applied for membership, in order to avoid possible gender biases we asked the receiver to pass the invitation to fill the survey in to the household member who first had the idea of joining *ènostra*
 - 298 people filled in the questionnaire completely, which represent 13% of those who read the email message – in line with the average response rate in the case of an online study without incentive (14%) (LaRose and Thays 2014).

Preliminary results

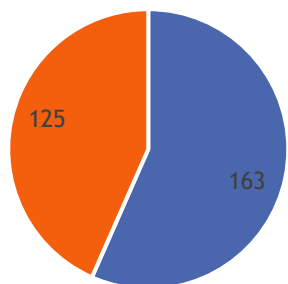
- In the following we will be illustrating the results of the very first analyses on our dataset, which is very rich
- We will not address all research questions, however setting the ground for answering them



Description of the sample

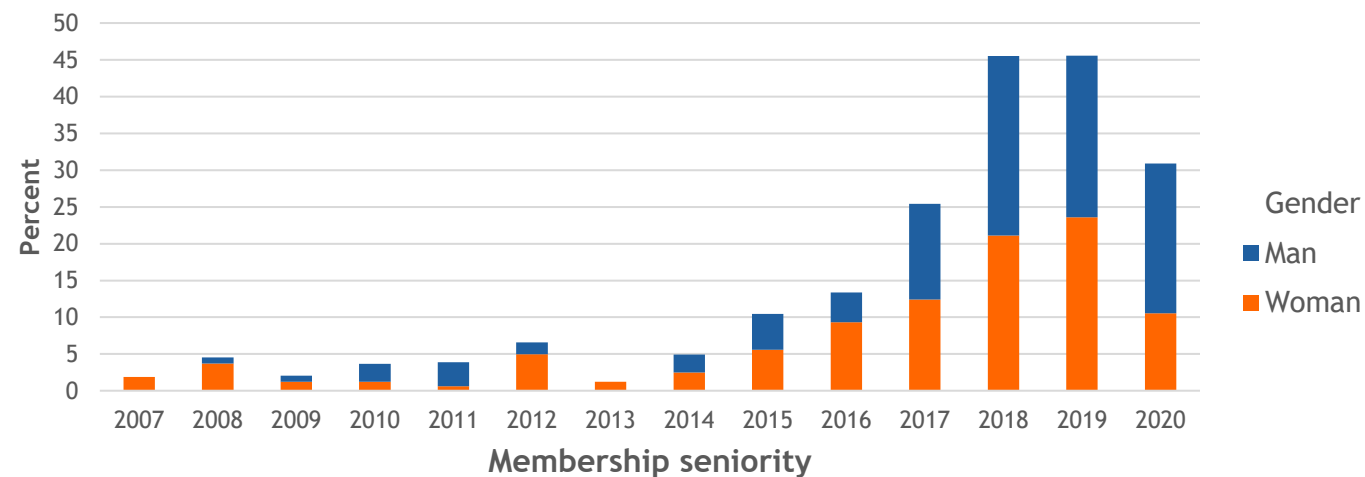
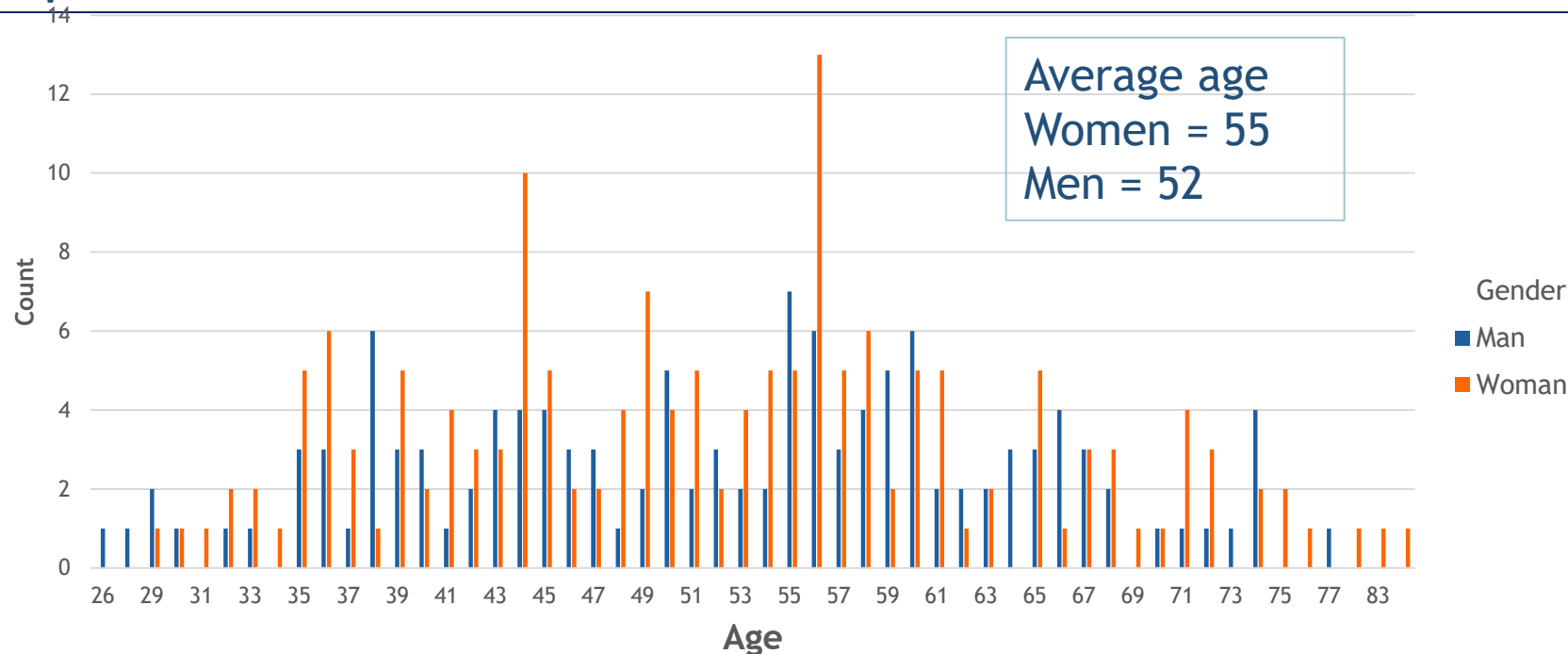


The sample composition



Gender

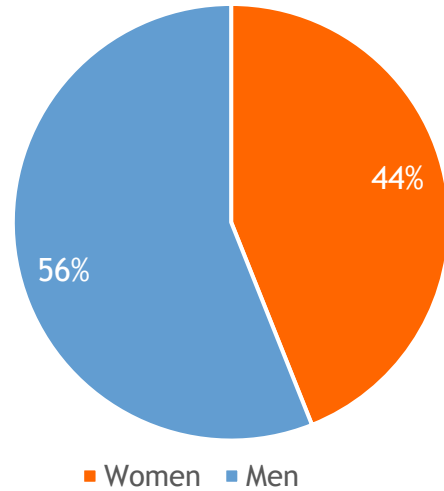
■ Men
■ Women



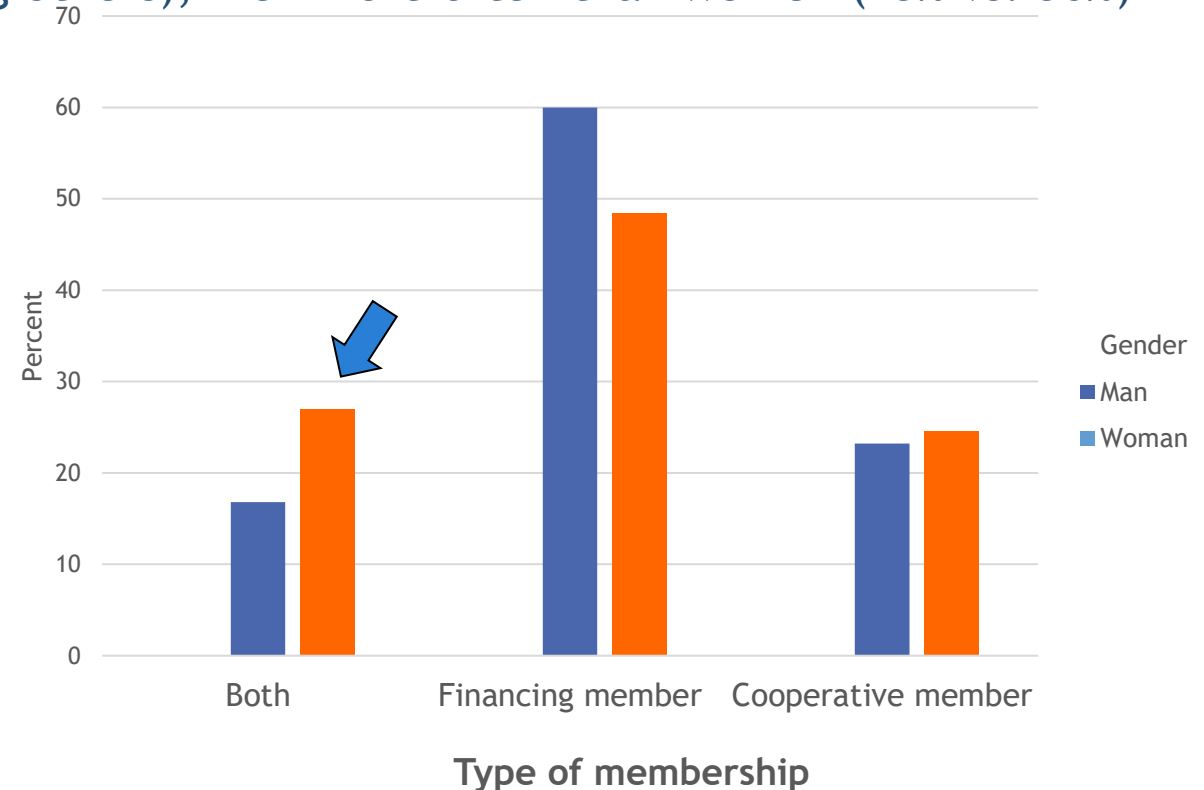
- The sample is rather balanced in its composition by gender, with an average age of 55 for women and 52 for men
- Women became shareholders since the early days of *énostra*, and continued joining the cooperative along the years



Joining the cooperative

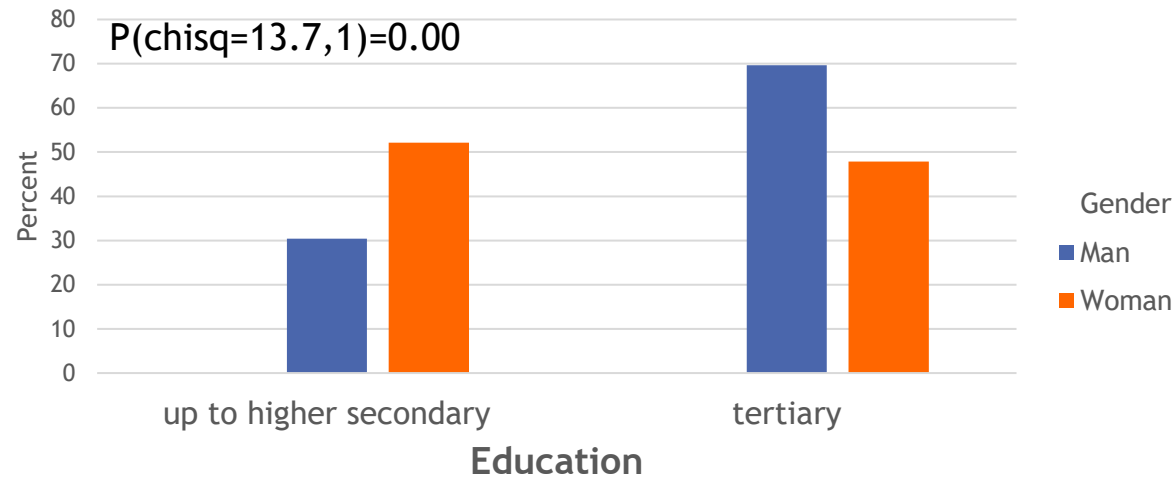


- In our sample, the decision to join the cooperative are men in 56% of the cases
- Before joining *ènostra*, 40% of our respondents were members of an NGO (Greenpeace, LIPU, WWF, Legambiente, among others), men more often than women (43% vs. 36%)



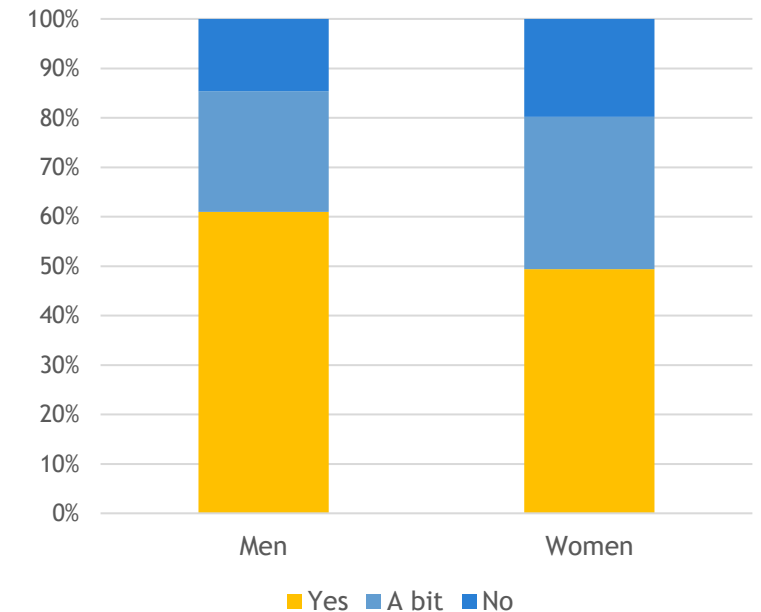
- Among our respondents, women are more often than men both financing members (“socio sovventore”) and cooperative members (“socio cooperatore”)

Education & field of study



- Our respondents are rather highly educated, with men more often holding a tertiary degree than women
- Also, men are more likely than women to have taken energy-related courses in their educational career, although the difference is not statistically significant

Probability of having studied energy-related issues, by gender



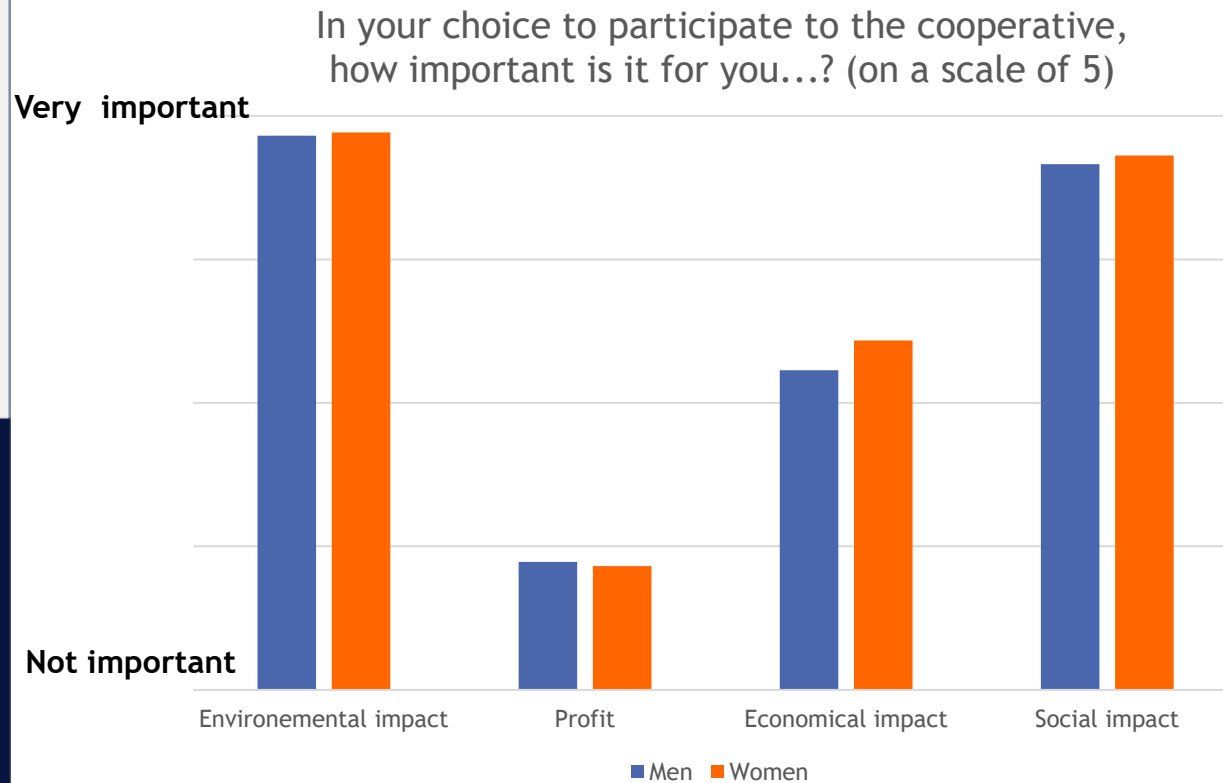
Probabilities from a logit model with field of study as dependent and age, gender, educational level and membership seniority as independent variables (LR chisq (8) = 25.21, $p=0.0014$)



Descriptive results



Gender and motivation for membership

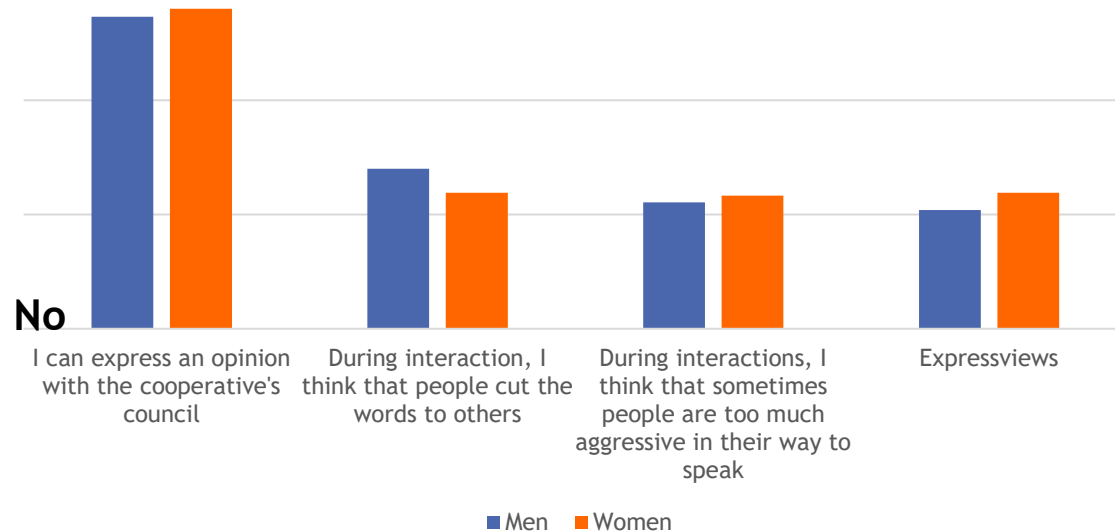


- Women and men both share a strong focus on environmental and social dimensions of the project, while the profit they could make with their investment is less important, or not important at all
- The economic impact of energy communities, such as local development and job creation, is also pretty important for *ènostra* members, again for men and women alike

Do women feel to be on a par with men in the cooperative?

Have people difficulties to express their views in the cooperative?

Yes



No

I can express an opinion with the cooperative's council
 During interaction, I think that people cut the words to others
 During interactions, I think that sometimes people are too much aggressive in their way to speak
 Expressviews

■ Men ■ Women

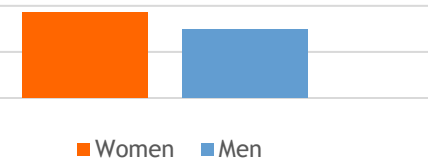
One-way ANOVA
 Women: mean = 2,86
 Men: mean = 2,49
 P = 0,04

- The cooperative is a friendly environment with people respectful in their exchanges: both men and women feel comfortable in expressing their own views during interactions with other members
- When analysed as a scale (with a Cronbach's alpha of 0.87), these items show that women's average score is slightly lower than men's, although this difference is not statistically significant

On a scale of 5, do you think that during interactions, men tend to take the floor...

Yes

No

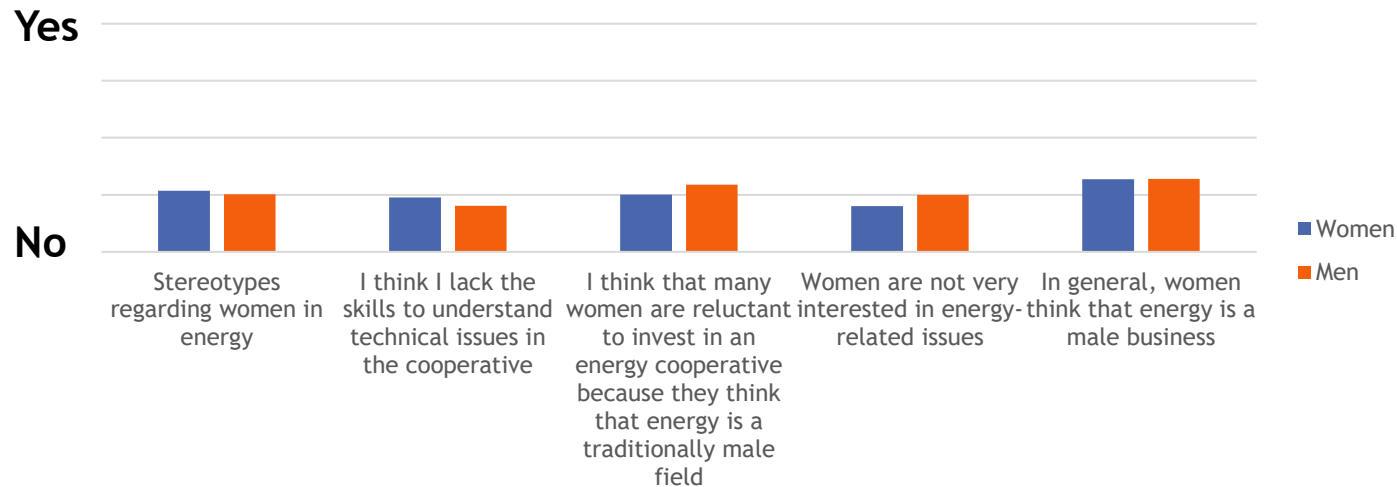


However, women think that men tend still to take the floor during the meetings, while men think they don't...



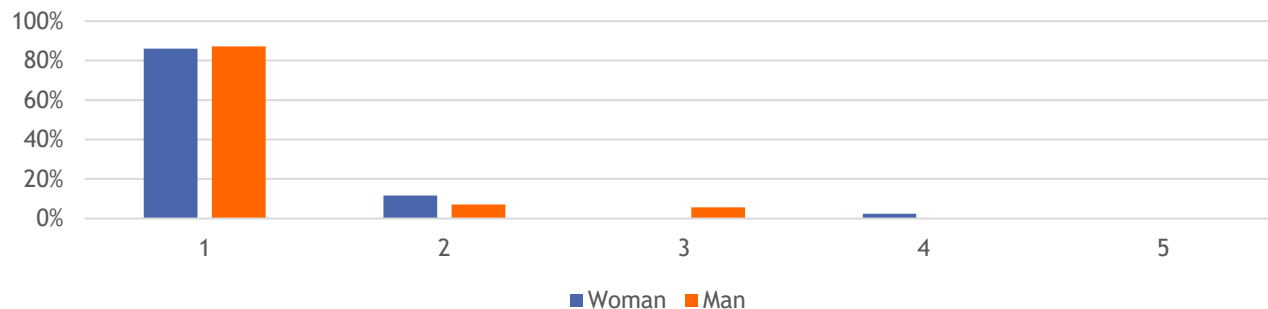
Gender stereotypes

Stereotypes regarding women



- A set of items investigated whether and to what extent respondents agree with gender stereotypes in the world of energy production
- The scale reliability (Cronbach's alpha) of this set of items is 0.75
- When analysed by gender, stereotypes are rather
- Moreover, we do not observe a gender difference on this scale.

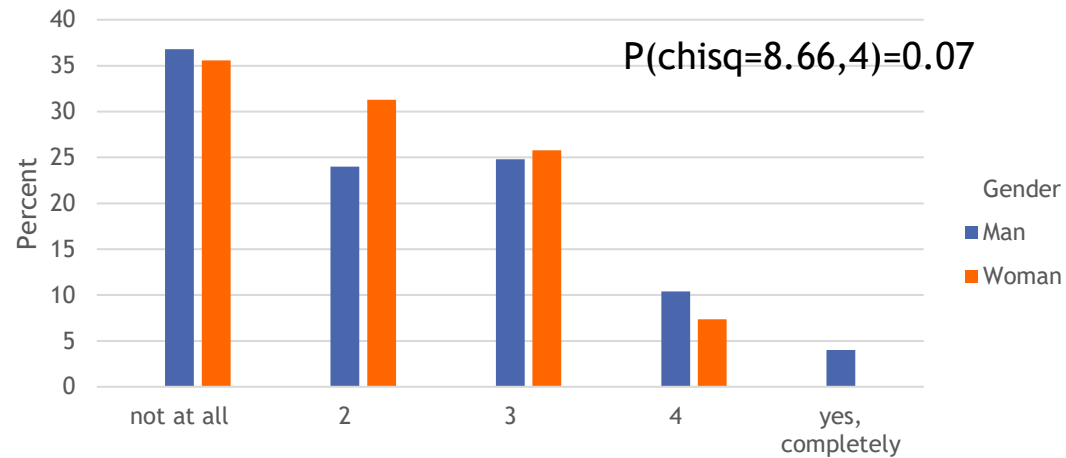
The cooperative has a good number of female technicians, who answer the help phone line. If you ever called that line, have you been surprised to discuss technical issues with a woman?



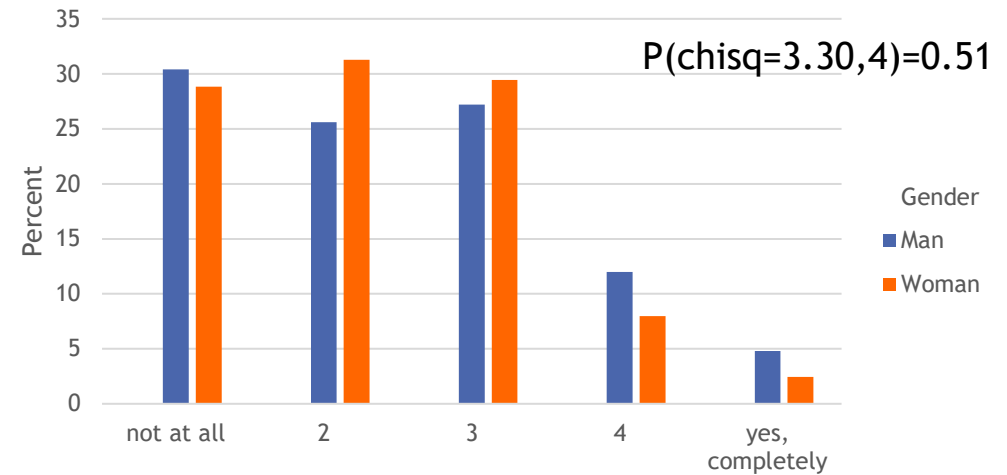
Ènostra has a lot of women occupying technical functions in the cooperative. When asking for women occupying technical position, shareholders are not surprised at all to have to deal with a woman on technical energetic issues either for men or women.

Self-efficacy indicators

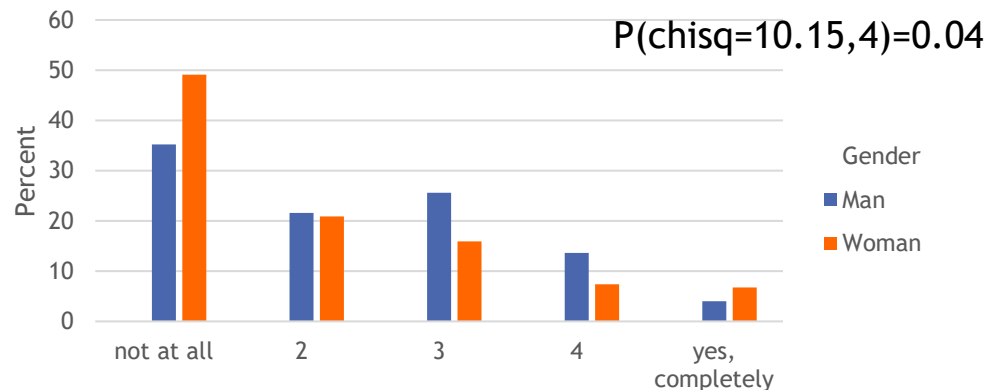
Understand investment decisions



Understand management

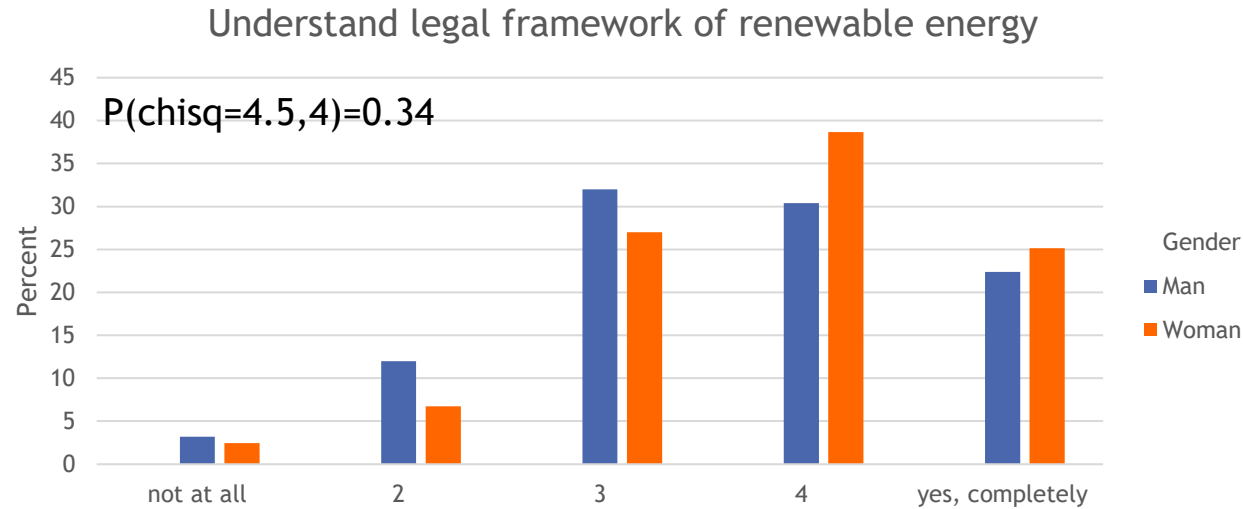


Understand electricity distribution in our network

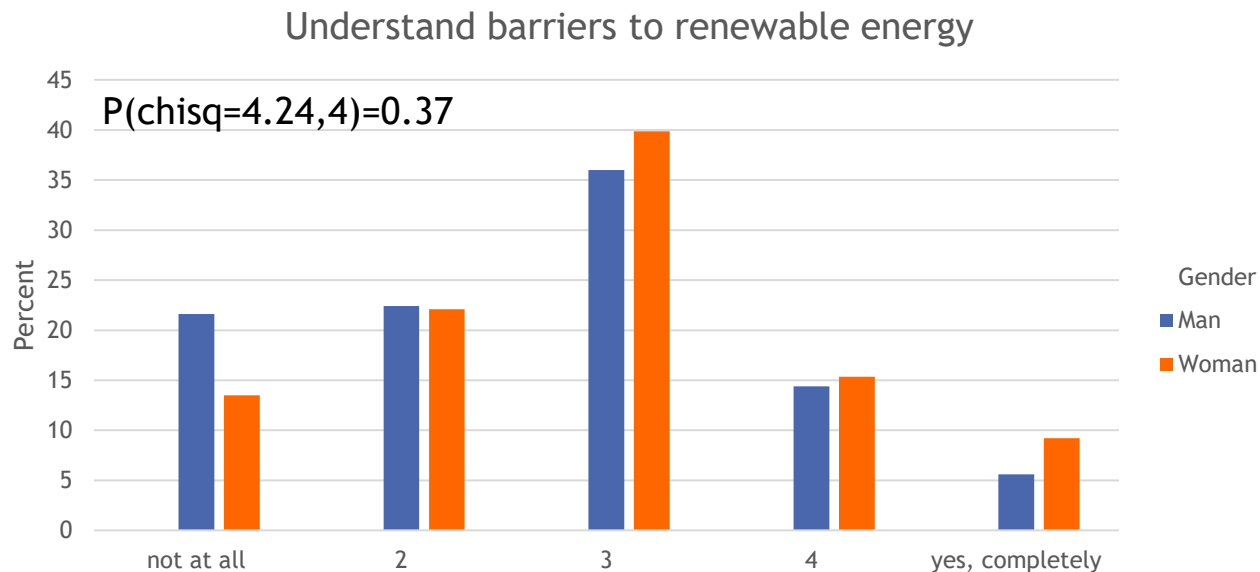


- When considering managerial issues in the cooperative (investment decisions and how management works), women and men show the same level of self-efficacy
- However, when technical issues are at stake, women say they are less able than men to understand them (and the difference is statistically significant)

More on self-efficacy...

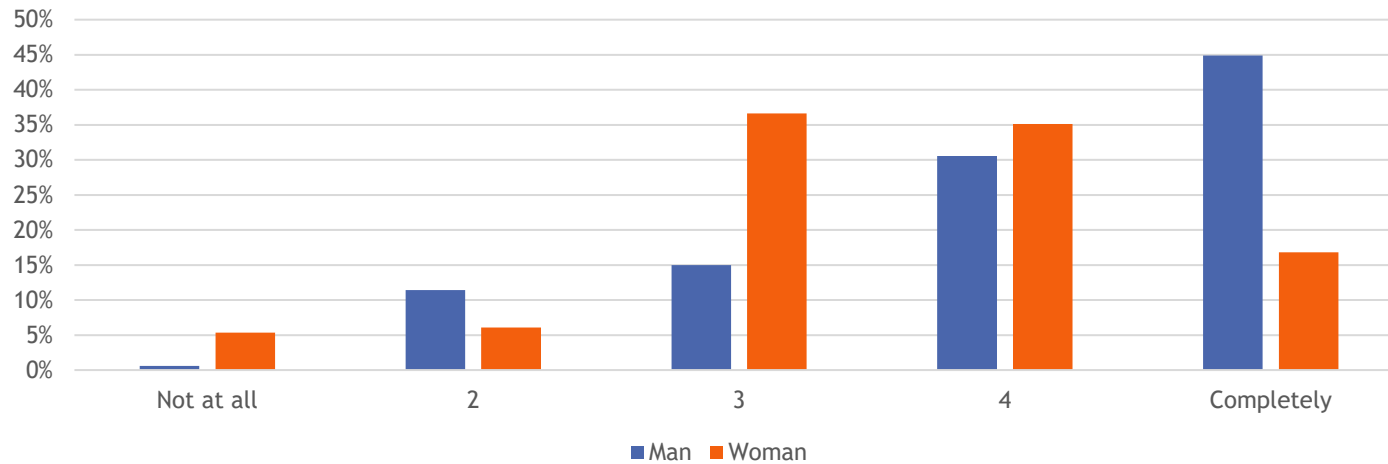


- When we consider another couple of non-technical issues, again women and men feel to be equally able to deal with
- However, when we consider another couple of questions on technical issues, women and men show marked differences (next slide)

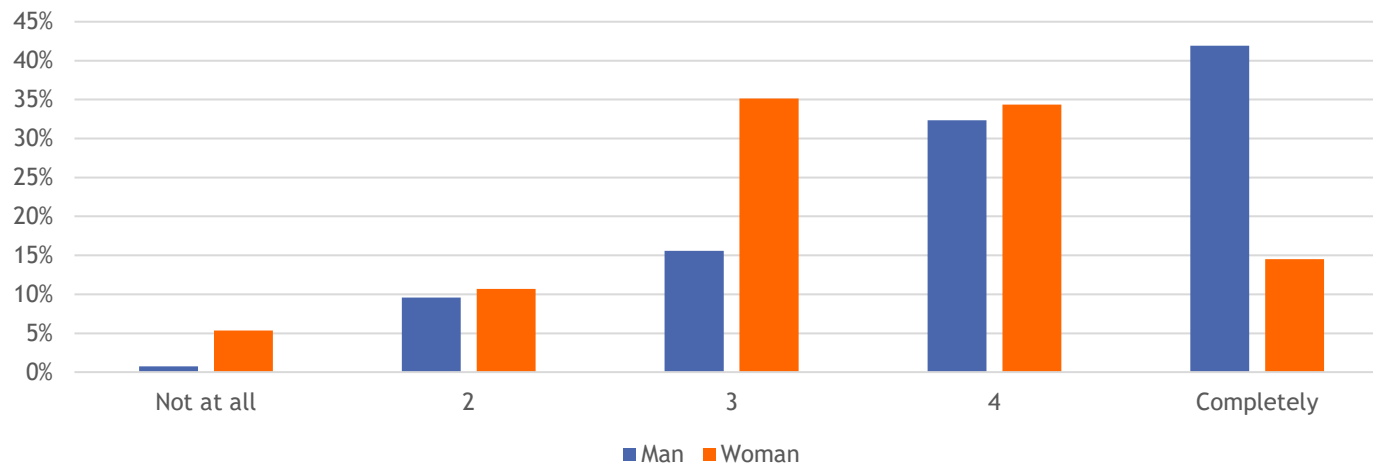


... with a difference

Easy to understand an eolic plant



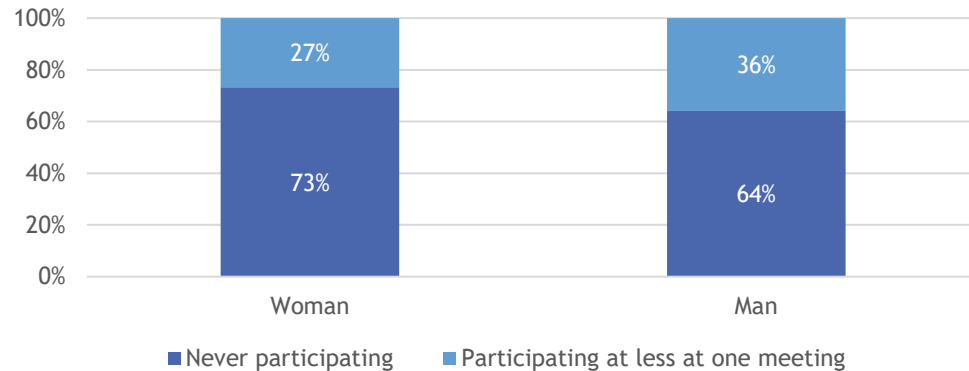
Easy to understand a photovoltaic plant



- Here we see wide differences by gender, with men saying **more often** than women that it is completely easy for them to understand how eolic and photovoltaic plants work
- When controlled for whether respondents had energy among their fields of study (plus age and membership seniority), this difference persists, almost unaltered

Taking part in the cooperative activities

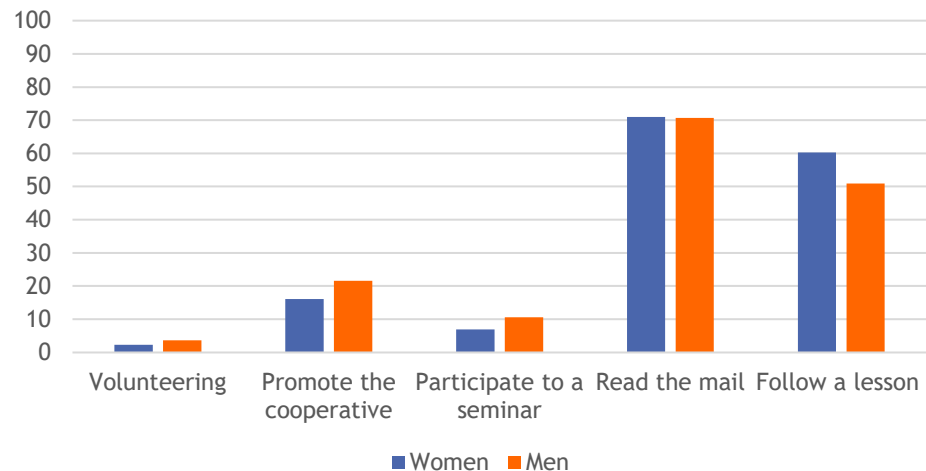
Have you already participating at less to one meeting in the cooperative?



Ha: diff < 0
 Women = 26,72%
 Men = 35.93%
 Pr (T < t) = 0,05
 One-way ANOVA
 P = 0,09

- Men and women show a different pattern of participation in *ènostra* activities
- On one side, women tend to attend meetings less often than men
- On the other side, women are more likely to attend courses to improve their technical skills on renewable energy, while men are more likely to engage in activities to make the cooperative known and to attend seminars

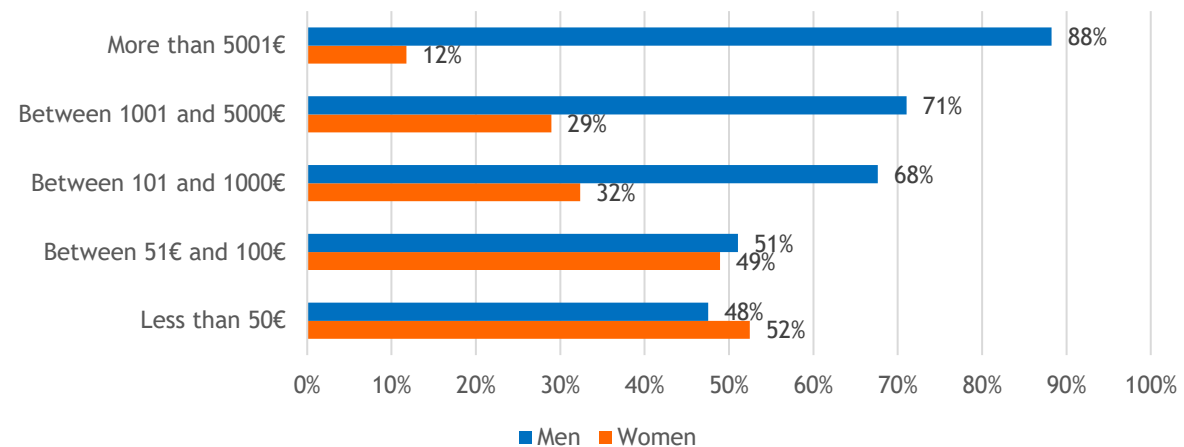
Activities done by members(%)



Ha: diff > 0
 Women = 60.31
 Men = 50.9
 Pr (T > t) = 0.05

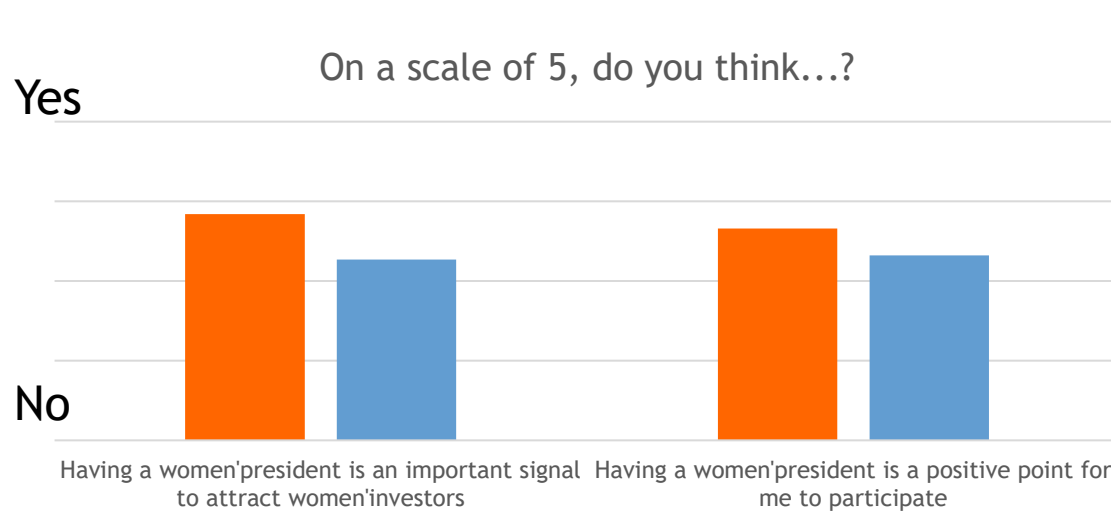
Taking part in the cooperative activities

Amount invested in the cooperative



One point to stress is also that investing is more difficult for women.

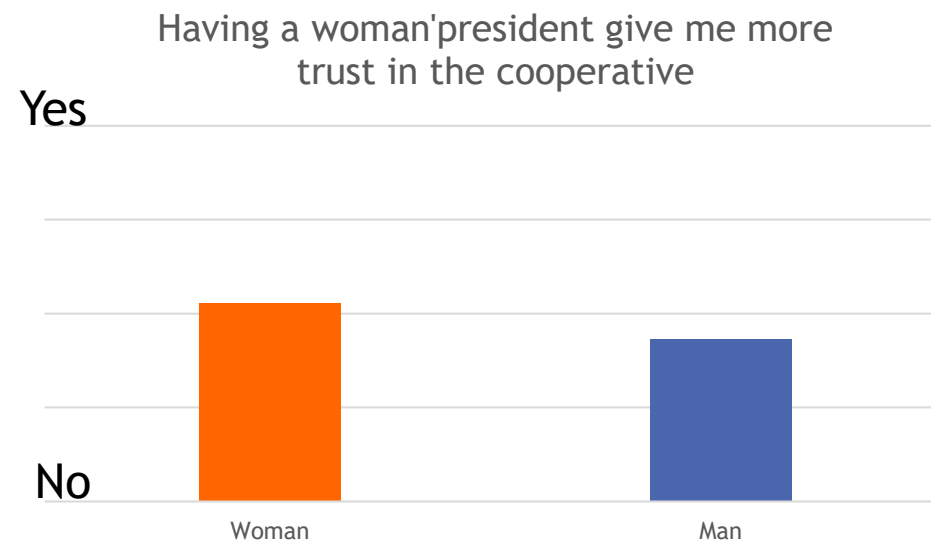
Role modelling?



One-way ANOVA
Women: mean = 3,84
Men: mean = 3,27
P = 0,00

Women Men

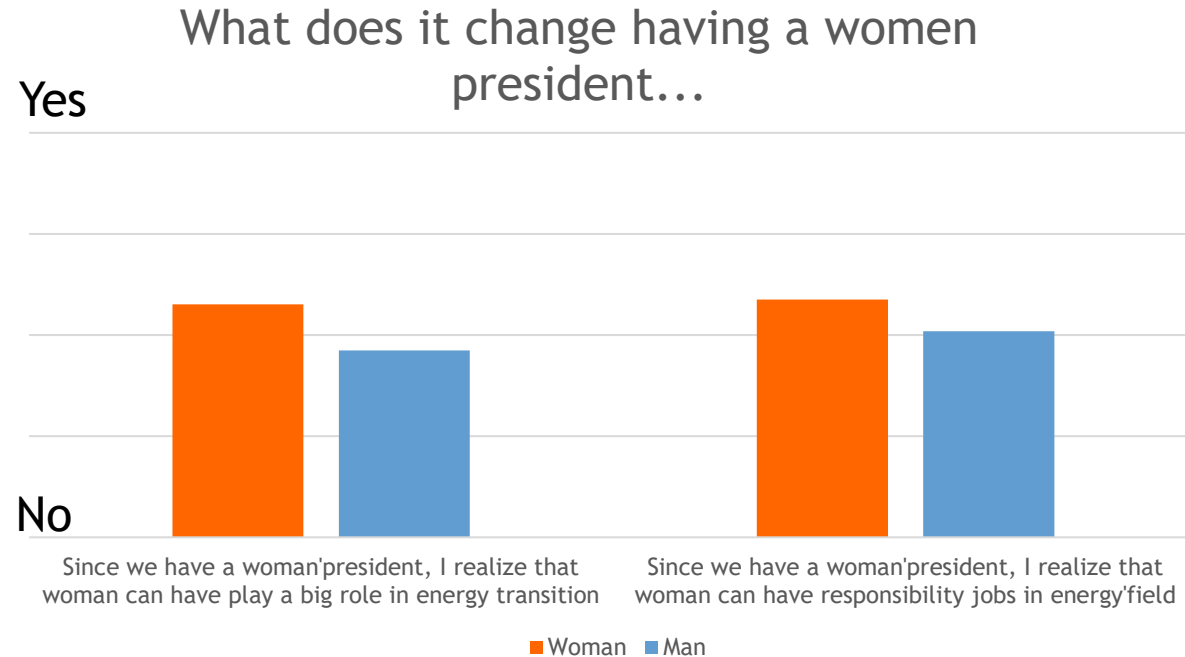
One-way ANOVA
Women: mean = 3,66
Men: mean = 3,32
P = 0,02



One-way ANOVA
Women: mean = 3,11
Men: mean = 2,73
P = 0,02

- Women think that having a woman as the cooperative president helps to attract more women as investors, while men think so less often
- Moreover, in female respondents' opinion, a female president is a factor that fosters their trust in the cooperative - in men's opinion too, but less often

More on role modelling



One-way ANOVA

Women: mean = 3,31

Men: mean = 2,85

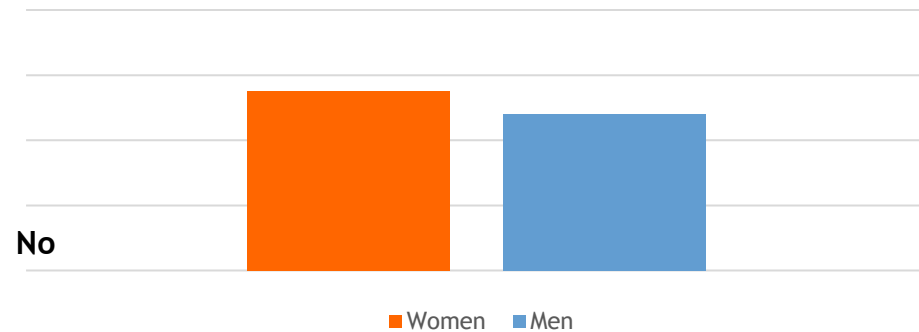
P = 0,01

- Having a female president acts as a role modelling, since it seems to be connected to women's views on women in the energy field, especially concerning the role they could play and jobs with responsibility they could get
- This is also true for men, albeit to a lesser extent

“Women’s wonderful effect”

On a scale of 5, do you think that having women in the executive board allow to have less competitive relations inside the cooperative?

Yes



No

One-way ANOVA
Women: mean = 3,76
Men: mean = 3,41
P = 0,01

- Our respondents agree that having women in the executive board of the cooperative brings less competition and more collaboration - a new relational style in energy communities?
- A belief shared more by women than men

Conclusion

- More is still to be done is analysing the data with more complex conceptual and statistical models
- Nonetheless, so far our data show that the energy world – as far as *ènostra* is concerned – is gender-neutral on many respects (motivation for becoming members, exchanging views)
- On the other side, gender (self)stereotyping is to some extent present, especially regarding womens'trust on their competencies
- *Ènostra* proves to be a woman-friendly environment, and as such is a role model in itself for bringing more women in the energy field, thus increasing its inclusiveness and democracy



Thank you!

Comments and remarks welcome!!

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