

**PART A - DISSERTATION**

**An Architects methodology for mediating the realms of Architecture, Design, and community in pursuance of equipping and empowering the community as custodians of a solar landscape through the plural agencies embedded in the role of the Architect.**

A dissertation submitted to the Technological University of Dublin in part fulfilment of the requirements for award of Masters in Architecture by;

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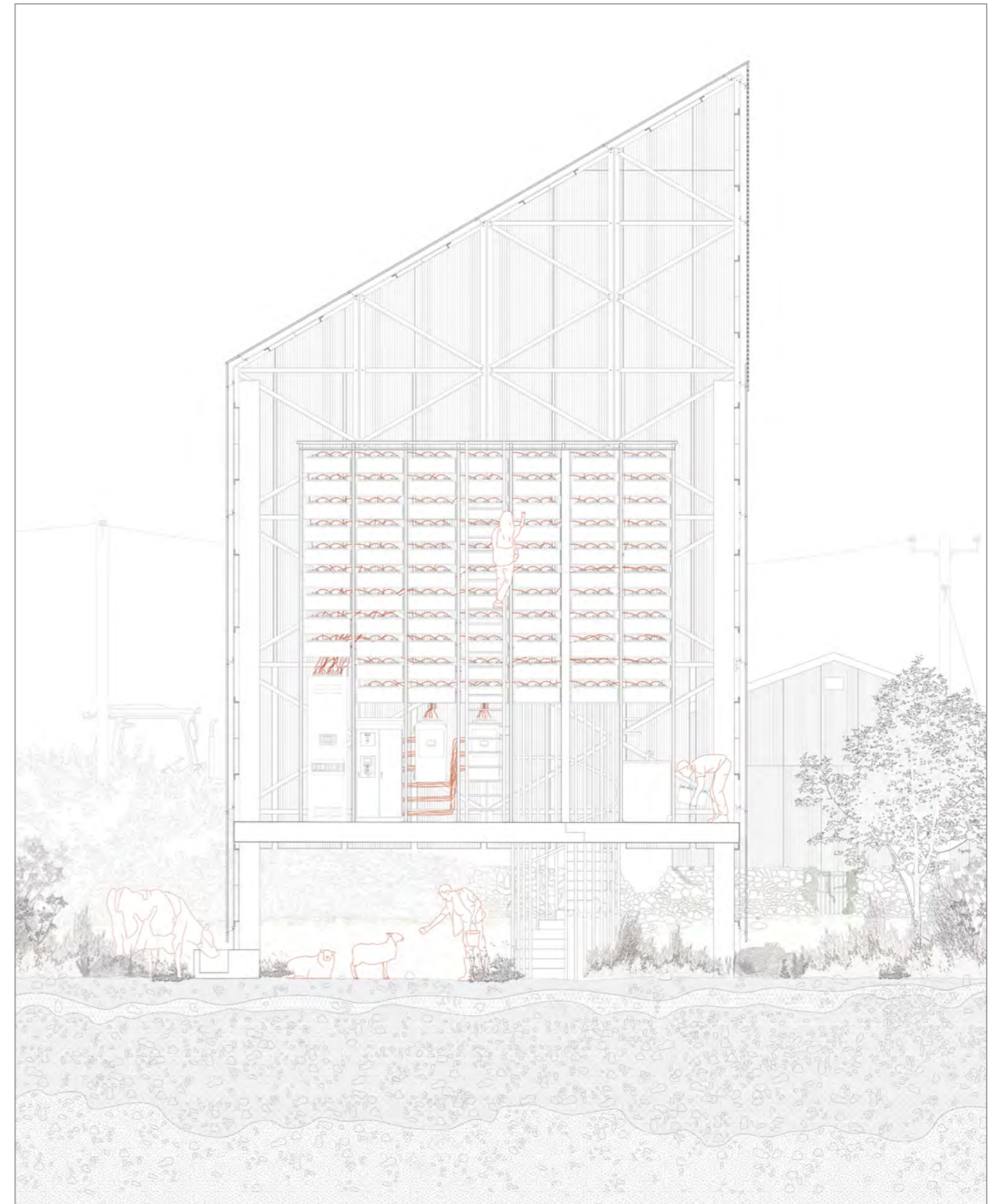
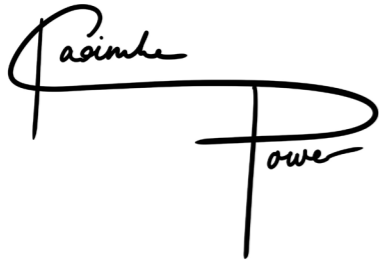


Fig. 1 Battery Cabin Section, Caoimhe Power 2022.

## Declaration:

I hereby certify that the material submitted in this dissertation toward the award of Masters in Architecture is entirely my own work and has not been submitted for assessment other than part-fulfilment of the award named above.

## Signature of candidate:

A handwritten signature in black ink. The name 'Pasimha' is written in a cursive style at the top, followed by a long horizontal line that loops back to the left. Below this line, the name 'Fowe' is written in a similar cursive style.

Date: 13 / 11 / 22

## Abstract:

The implementation of community renewable energy systems is taking place across Ireland, with agricultural landscapes transitioning to that of energy landscapes to harvest and provide renewable energy to its people whilst generating a revenue stream to meet community needs. To ensure that communities transition in a just, ethical and elective manner through co-operative methods an architect can use their position to offer perspectives in co-creating a joint future using an architect's capacity to communicate a landscape in transition to its people by empowering them as custodians of this solar landscape – equipping them with the information and elective participatory design tools required to initiate this renewable energy project on their landscape. This will give the co-operative transition a visual presence within the community whilst establishing the role of the architect as facilitator of engagement, deliberation and participatory co-operation.

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## Acknowledgements:

I would like to thank my fellow MArch students for providing an environment of friendship, creativity and collaboration. I wish all my comrades the best in their future ventures and I hope one day that some of us will end up collaborating once more. In addition to this, I owe my parents gratitude for their support since my first day entering Linenhall and my sister for putting up with me this past semester. Finally, I give my sincere thanks to my supervisors Steve Larkin and Kevin Donovan for motivating me throughout my research and prompting me to explore my future role as an Architect.

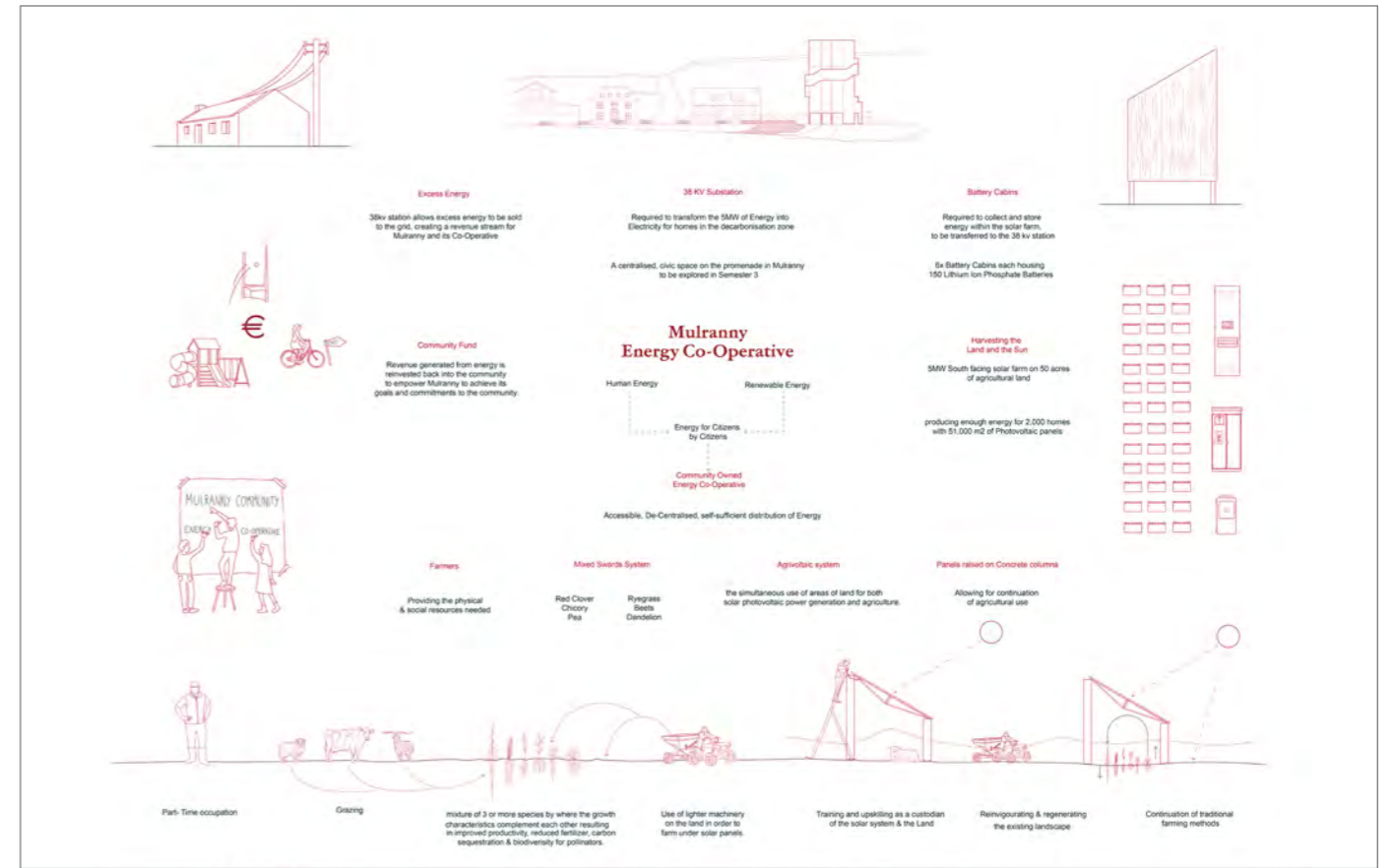


Fig. 2 Semester 2 Proposal diagram, Caoimhe Power 2022.

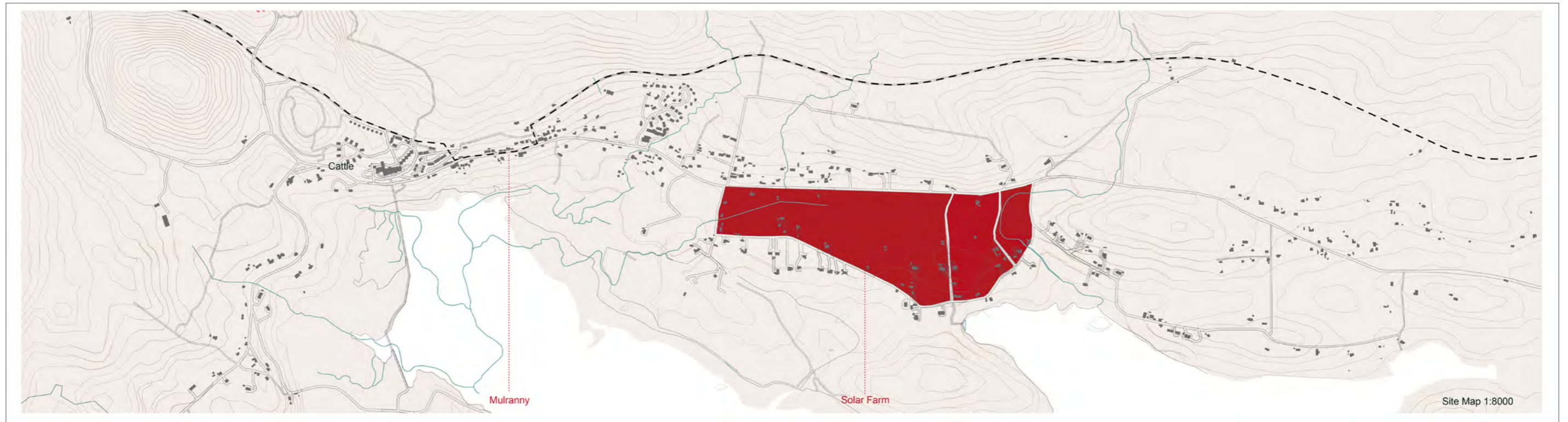


Fig. 3 Site Map, proximity of solar farm site to Mulranny, Caoimhe Power 2022.

# Research Area

A full system sustainability revolution is upon us, bringing with it "... the most profound disruption of the energy sector in over a century ... an energy revolution that brings about an era of superabundant clean energy unlike anything we've seen before." (Yu, Whittell, Jackson, Dorr & Donti, 2022) The economic competitiveness of solar, wind and batteries will be overwhelming, resulting in an abundance of renewable energy. However, when something new comes along it can be utterly disruptive to what came before. Thus, the focus on a just transition is paramount to avoid leaving people and communities behind, an ethically designed transition that brings people along with it. The energy transition can be seen as an opportunity to address societal issues of inequality, ensuring the poorest in society are not hurt by the transition but aided by it. The support of the masses is required to move forward with this transformation which can be achieved through a clear, ethical and transparent form of engagement and communication.

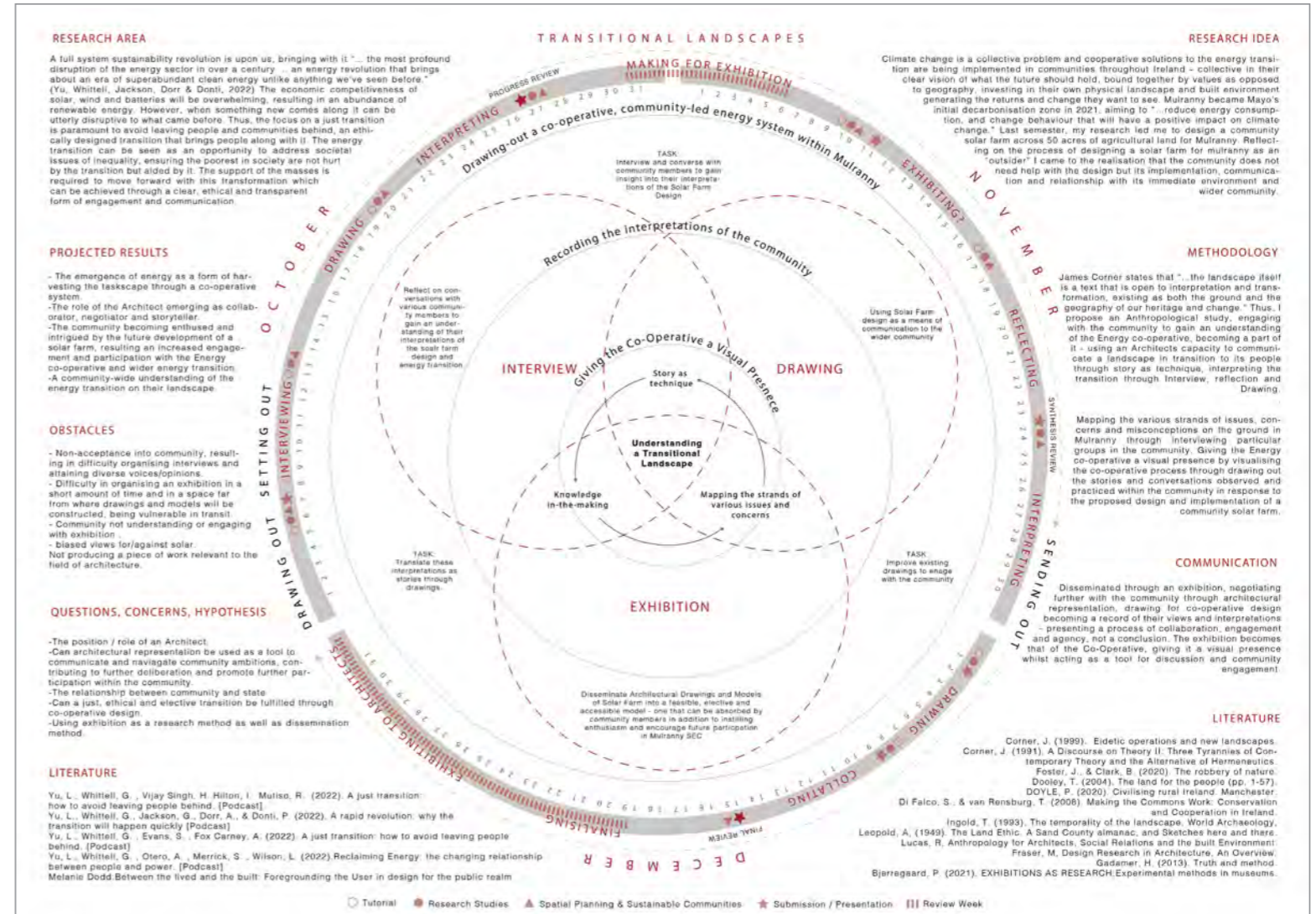


Fig. 4 Illustrated initial research plan, Caoimhe Power 2022.

## Research Idea

Climate change is a collective problem and cooperative solutions to the energy transition are being implemented in communities throughout Ireland - collective in their clear vision of what the future should hold, bound together by values as opposed to geography, investing in their own physical landscape and built environment generating the returns and change they want to see. Mulranny became Mayo's initial decarbonisation zone in 2021, aiming to "...reduce energy consumption, and change behaviour that will have a positive impact on climate change." Community initiators – such as Carol Lo us and Sean Carolan are involved in a multitude of organisations in Mulranny. Carol aided the initiation and establishment of Mulranny Sustainable Energy Community in conjunction with the SEAI, a government body established to promote sustainable energy throughout Ireland. It is Mulranny SEC that aims to establish an energy co-operative system within the community and eventually a solar farm – which is the main point of deliberation and communication within this piece of research.

Last semester, my research led me to design a community solar farm across 50 acres of agricultural land for Mulranny. Reflecting on the process of designing a solar farm for Mulranny as an "outsider" I came to the realisation that in addition to the design the community required support with the design but its implementation, communication and relationship with its immediate environment and wider community. If Mulranny is to achieve an equal, ethical and collective transition there needs to be a clear communication of what the transition is, what it requires, where it is going, what its implications will be and how a co-operative system can achieve this. Architecture can be used to "... solve problems beyond those relevant to architects themselves..." (Cesal, E. 2010) with "...the use of a certain architectural representation as a communication means, that could be a ractive and well understood by the community, can encourage public engagement, discussion and generation of ideas, by this ensuring their collaboration during the planning and design process, as active participants and well-informed citizens." (Jakupi, Jashari-Kajtazi, 2018). Design and leadership are essentially the same activity. (Cesal, E. 2010)

Architectural practices undertaking research within the realm of community engagement and participation such as Metropolitan workshop have explored the issue of “...what constitutes meaningful community engagement in practice” within co-housing and co-operative housing developments. (People Powered Places, 2021) In conducting their “Living Closer” research, Studio Weave focused “...less on building types and delivery mechanisms and more on the individuals involved in these diverse schemes... to provide the human face of co-housing, capturing the diversity of personalities, journeys, roles and needs as well as generating deeper understanding of what motivates individuals to initiate or join co-housing developments and what they feel to stand to gain.” (Living Closer: the many faces of co-housing, 2018) It is apparent that investigating the engagement between communities and housing developments based on co-living and co-operative principles is being explored within architectural research, however, communities and projects on the peripheral of “Architecture” should be considered when addressing the role of Architects participating with, for and through communities “Acting as impartial listeners while offering perspectives in co-creating a joint future.” (My Carlow, 2017) In My Carlow, Studio Weave have demonstrated how Architectural research and its communication to the community through Storytelling can “...unlock and empower people in the quest to

research and its communication to the community through Storytelling can “...unlock and empower people in the quest to navigate the world - using narrative as a tool to unlock shared visions of the future.” (My Carlow, 2017) If Mulranny is to attain its decarbonisation goals by 2030, primarily through the implementation of an Energy Co-Operative Solar Farm, can the capacity of an Architect to communicate and visualise this energy transition to its people be explored through anthropological methods whilst equipping the community with the necessary tools to further empower themselves as custodians of this solar landscape?

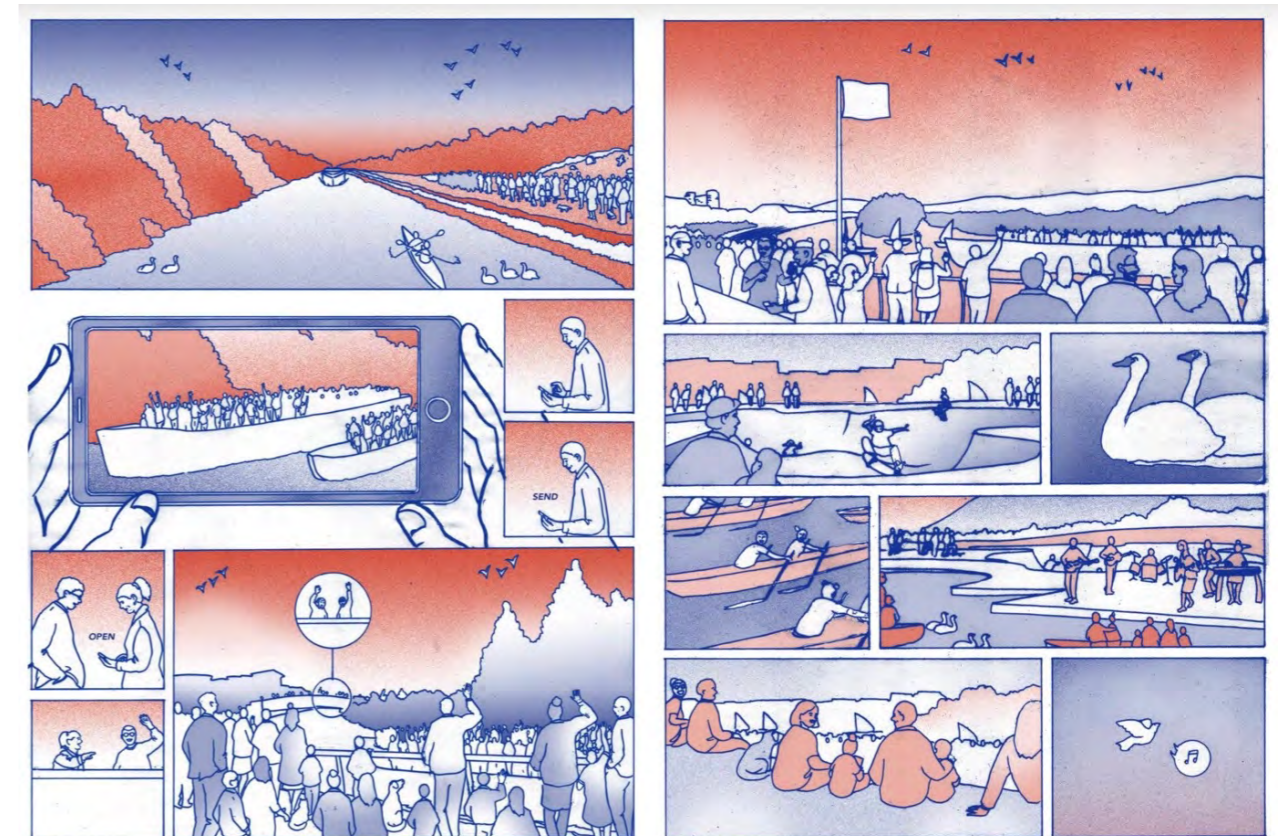


Fig. 5 My Carlow, 2017, illustration by Liam Cobb for Studio Weave.



## Methodolgy

James Corner states that “...the landscape itself is a text that is open to interpretation and transformation, existing as both the ground and the geography of our heritage and change.” (Corner, 1999) Thus, I proposed an Anthropological study, engaging with the community to gain an understanding of the Energy co-operative, becoming a part of it - using an Architects capacity to communicate an evolving landscape to its people, unfolding its narrative through Interview, Drawing, Imaging, reflection and exhibition.

### Interview

In order to map the various strands of issues, concerns and misconceptions on the ground in Mulranny, interview was the first method that I proposed to utilise, through conducting semi-structured interviews and conversations with particular groups ( Mulranny Sustainable Energy Community, Mulranny Community Futures, Mulranny Mens Shed, Mulranny Tidy Towns, Hotel ) and individuals (Business Owners, Farmers, Land owners, Residents, Holidaymakers, Students, Pensioners, Families ) in the community. The first step in this process was to gather, engage and hold a discussion with individuals, using Carol Lo us and Sean Carolan as a point of contact for identifying and interviewing the aforemen-

tioned individuals and groups, providing a rich scope of perceptions and interpretations. From here, I expected to identify members of the community that would be directly affected by the solar farm in terms of land ownership and land-use on the designated site of the design. Interviews conducted with farmers and land-owners were expected to provide a variety of opinions and interpretations on the subjects of the energy co-operative, the energy transition and the solar farm.

### Drawing

After each interview, I proposed to interpret the stories and conversations had through drawing. Drawing out these interpretations into stories could assist in generating knowledge and an understanding of the energy transition in Mulranny. Each Interview would result in a drawing which embodies a layer of understanding, each layer informing the design and evolution of the energy co-operative and solar farm. This, in turn, would evolve into an elective and ethical system of community energy on the landscape. Drawing and other forms of architectural representation could give the Energy co-operative a visual presence by visualising the co-operative process through drawing out the stories and conversations observed within the community.

### Exhibition

The resultant drawings and research would be disseminated through an exhibition, negotiating further with the community through architectural representation with drawing for

co-operative design becoming a record of their views and interpretations – presenting a process of collaboration, engagement and agency. Previous drawings from the Solar Farm design would be updated accordingly in response to the stories and evolve into a design of the community, not the outsider. Drawings of the stories that evolve from the interviews would be illustrated in such a way as to engage with members of the community of Mulranny, and instill a sense of enthusiasm, using “...the power of stories to unlock and empower people in the quest to navigate the world - using narrative as a tool to unlock shared visions of the future.” The exhibition would become that of the Co-Operative, giving it a visual presence whilst acting as a tool for discussion and community engagement. In conjunction with the exhibition acting as a form of community engagement and dissemination, it should also be considered as a method of research in itself, as “knowledge-in-the-making” and speculating the role of the community as audience if research is extended to the exhibition. ( Bjerregaard, P. 2021).

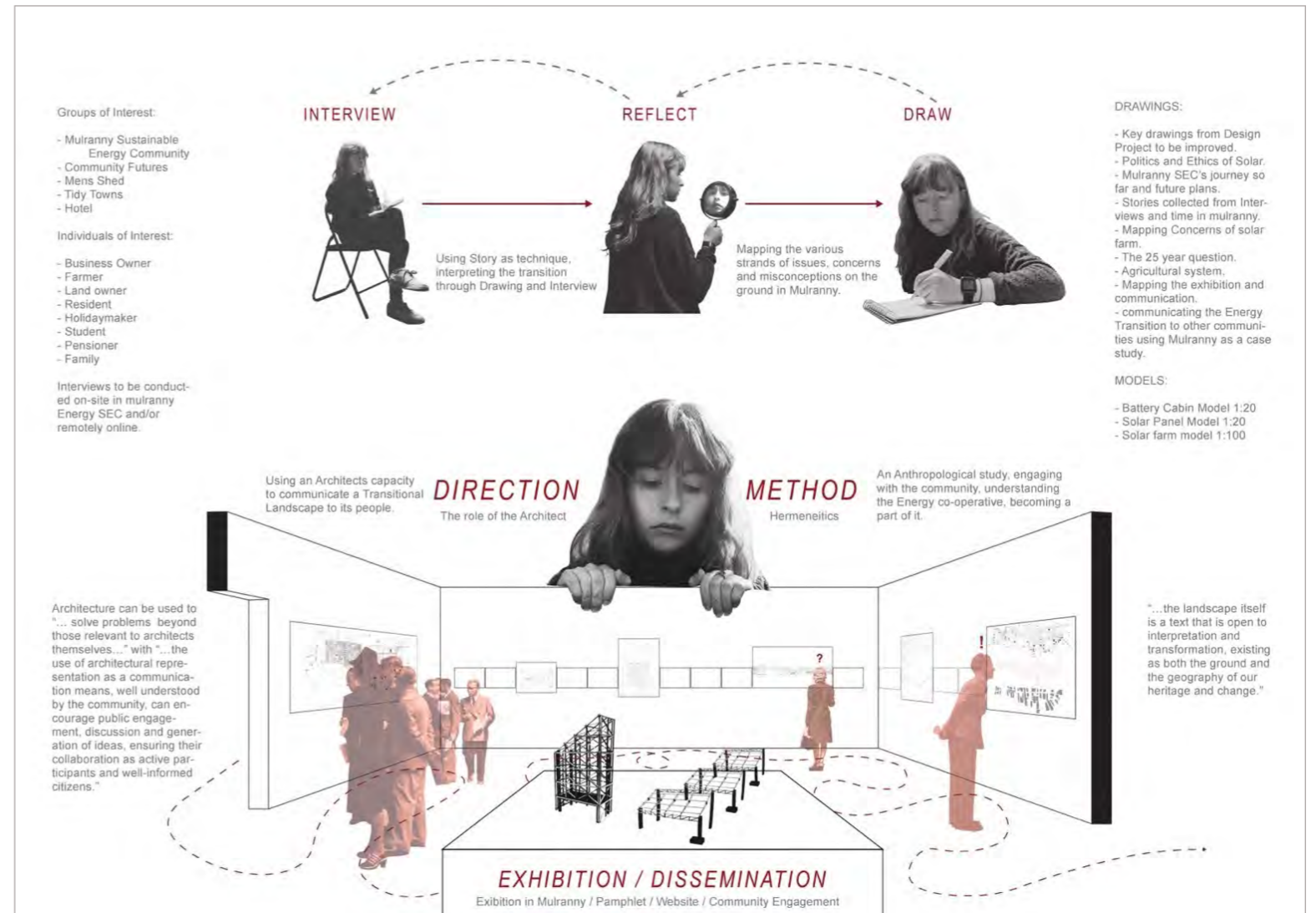


Fig. 6 Direction & Method, Caoimhe Power, 2022. Illustration establishing the methods to be employed as part of research.

## Research Concerns & Obstacles

### Time

The use of anthropological methods within a period of three months is an anticipated challenge in relation to gathering and collecting interviews with members of the community, drawing out these interviews, building on existing work and exhibiting this research.

### Interviews

Presumptions have been made in regard to obtaining consent for interview and finding the correct people to interview, there is always the risk of non-acceptance in the community and being seen as an “outsider”. This can result in people not wanting to be interviewed due to concerns about their views being shared, manipulated and privacy breached. Thus, an ethical and balanced approach to obtaining interviews should be implemented.

### Existing Interpretations

There is a risk that the community does not indeed want a solar farm established and there are existing tensions within the community on the matter. Getting involved and attempting to interpret why people have these views could result in added tension and render the establishment of a energy co-operative solar farm unachievable.

### Community interpretation after exhibition.

When the community gathers to absorb the means by which the research is communicated at the proposed exhibition, rather than promote the idea of an energy co-operative solar farm for the community, the research and how its communicated could instil confusion, anger and non-acceptance amongst community members. This would be a catastrophe for Mulranny SEC and all it has achieved to this point, thus, the communication of work needs to be careful and attentive - well-informed by existing opinions within the community.

## The Process

Many challenges were encountered due to the nature of community based research and the pre-selected methodology, research idea and research outputs had to react and evolve with the challenges and limitations they were confronted with. From the outset, this research set led on participating with the community and as an architect, communicating what you observe from the community through interview, architectural representation and exhibition. These methods established at the beginning of the research had to react to the difficulty in organising interviews with community members – without the interview as a base layer to the drawings, there was no content to work with and no interpretations to evolve into exhibition drawings. As the research progressed and encountered these predicted challenges, it became apparent that the research was focusing primarily on communicating solely to the community rather than acknowledging that Architects were inevitably going to be a part of this audience and process - resulting in drawings overly dictated by text and diagram, not elucidating to the episodic, visual effect of this proposed infrastructure on the ground. Thus, in reaction to this, the research evolved into giving the Solar Farm a visual presence within the community in pursuance of initiating conversation and enthusiasm amongst the people of Mulranny alongside developing a methodology for architects to utilise when engaging and participating with communities on such

projects - resulting in the following question;

*How to mediate the realms of Architecture, Design and community through architectural representation in pursuance of equipping and empowering the community custodians of a solar landscape through the plural agencies embedded in the role of the Architect?*

Firstly, a method of drawing or imaging needed to be resolved, one that communicates to both architects and community whilst still allowing room for speculation. Secondly, interview would continue as a method but due to the restrictions involved, using Sean and Carol as the primary sources for interview and information was sufficient due to their knowledge and ongoing engagement with their community. As part of this process, it became apparent that organising community engagement and participation through workshops and/or exhibition was beyond the scope of the time of the project. Albeit this is something that could subsequently be continued in the community after this research has been conducted, continued by me, the architect and researcher, or another architect at a later date. Thus, rather than conducting the participation, due to the limitations, as the architect and researcher I would design the participation. These participatory drawings could then become a tool for the community in conjunction with an architect to use as part of the engagement process with the Solar farm.

## Establishing Communication, interpretation & Narrative

### Eidetic Imagery - Communicating an evolving Landscape:

James Corner asserts that “Landscape and image are inseparable. Without image there is no such thing as landscape, only unmediated environment.” (Corner, 1999) The design project of the Community Solar farm resulted from the interpretation of the landscape of Mulranny as an outsider; “... the tourist, the spectator, the state, the administrative authority, the designer and planner – views landscape as an object, a thing to behold, and not only scenically but instrumentally and ideologically.” (Corner, 1999) The relationship between inhabitant and outsider has been one of division, misunderstanding and alienation on the Irish landscape – with the outsider kept at a “safe and uninvolved distance” and the inhabitant bending to the rules of “synoptic management of land”. (Corner, 1999) When conversing with Sean Carolan and Carol Lo us it transpired that one of the lessons they have learned from engaging with their community in the past is that “...when visualisation is done so well its extremely powerful...and it enthuses people when they see what is possible ... it does encourage other people to imagine what we’ve been thinking. You get enthusiastic when somebody else shows you what is possible visually. With Sean adding: “I think it would create a lot of positive outcomes to

show people a community-led holistic design rather than developer and land owner led. At the moment, development is very much individually led.” This suggests the impact of architectural visualisation on everyday inhabitants and its utilisation as a tool for negotiating relationships between the various stakeholders on this evolving landscape.

Limitations to the representation of landscape could be surmounted by reorienting the architectural project toward the constructive and collaborative phenomenon of the prosaic, functioning landscape, reiterating “...the experiential intimacies of engagement, participation, and use over time...less to picture or represent these activities than it is to facilitate, instigate and diversify their effects in time...” with the advancement of more performative forms of imaging as paramount to this undertaking. (Corner, 1999) Corner contends that “...Imaging always exercises agency, actively unfolding, generating, and actualizing emergent realities...”. The emerging enquiry not being the types of images the designer should consort with but rather what sets of imaging activities should be formulated and progressed. (Corner, 1999) - “...the actual durational experience of mapping, drawing, modelling, and making as a generative sequence in creative thinking.” (Corner, 1999)

The metaphoric agency of imaging compiles multiple elements, cultivating a host of ancillary possibilities; "...the pairing of two elements to produce new image, a conception that is otherwise not picturable." (Corner, 1999) Corner maintains that we fail to acknowledge the efficacy of plan, perspective and rendering and proclaims a "need to revise, enhance, invent forms of representational technique that might engender more engaging landscapes..." and proposes Eidetic Operations – "specific ideational techniques for construing (imagining) and constructing (projecting) new landscapes." (Corner, 1999) The landscape in Mulranny is not new but evolving and the design of the community solar farm is not realised but imagined. Eidetic images do not illustrate the actuality of a design but Initiate its possibility, (Corner, 1999) reiterating the need for visualising the community solar farm and its co-operative process in Mulranny to its people.

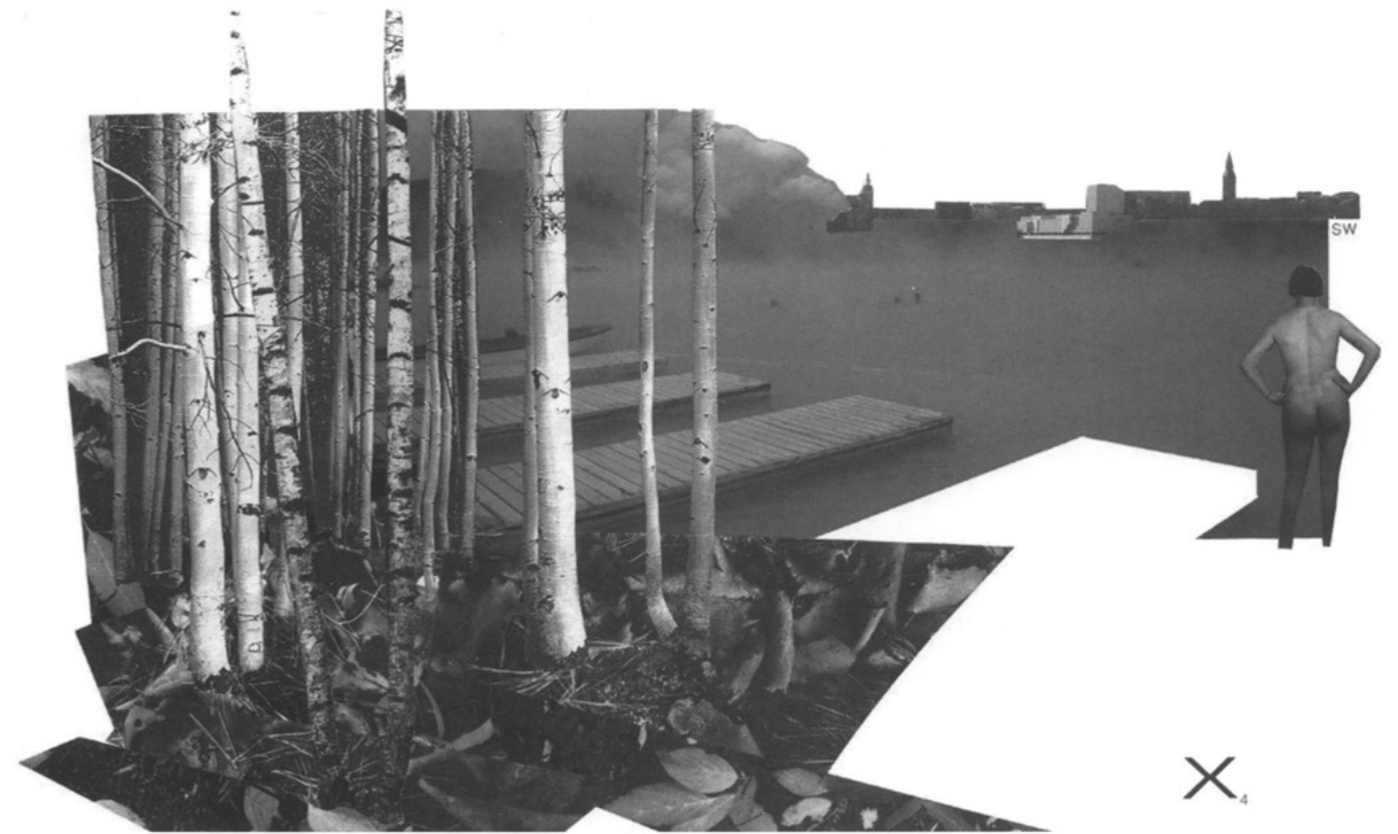


Fig. 7 View Across Lake Toward the City's Horizon. Eidetic photomontage employing generalized depiction of place, rough extractions, and an ambiguous frame. (Corner 1999; with permission of James Corner Field Operations).

#### **Eidetic Photomontage – sponsoring multiple interpretations into a narrative:**

The prevalence of photomontage in current culture indicates "...that many people are comfortable reading, interpreting, and creating information using these images, positioning photomontage squarely in the contemporary visual milieu." (Belanger & Urton, 2014) Through eidetic methodology, photomontage performs a productive function in thinking, rather than bound to a representational role with the strength to activate ideas.

Archigram's evocative photomontage "Instant City Airship, The Airship in Lancashire," depicts a massive dirigible transplanting urban structures and iconic pop- cultural images to a seemingly provincial village in a mountainous terrain.

In architecture, the combination of 3D modelling, image collage and mixed media focus "...on conceptual development and ideas rather than accurately depicting a spatial condition." Like Archigram before them, GROSS. MAX. uses photomontage as a generator of ideas, with the act of its crafting as crucial as the composition itself: "For us the image acts as a preview and eye-opener, a view but also a point of view" (Hooftman 2009, 39). Utilising the abstract nature of collage, eidetic photomontage advocates multiple narratives, remaining free for interpretative dialogue from varying standpoints. Eidetic photomontage promotes and encourages an open and speculative interpretation of design – its value lies in its ability to communicate the conceptual whilst having agency in fostering methods of thought creativity and imagination



Fig. 8 Archigram, Instant City Airship, The Airship in Lancashire, 1968.



Fig. 9 GROSS.MAX, Zuiderzee Museum, eidetic photomontage, 2008.

Whilst not intended, early drawings and images composed to translate the design project into a research area encompass eidetic methods and its agency as a tool of communication. “Framing: The Politics and Ethics of Solar” stemmed from questions posed in a critical review of the design project - through the process of layering section, montage and text the drawing aided the establishment of the research area as the communication of the energy transition. Following this, “The Transition So Far”, is an interpretive drawing of an interview by the SEAI 180° podcast with Carol Loftus. The drawing aims to communicate to how Mulranny established itself as a SEC whilst giving a visual presence to what the community has achieved so far in its energy transition - employing similar techniques by collating a series of line drawings as an alternative to photo-montage.

The Co-Operative” is intended as a participative drawing – one that can be drawn upon with community members when conversing about the solar farm, omitting the need to go through numerous drawings and presentations to communicate it whilst allowing the conversation to be concise and informative. Elements of the previously mentioned drawings are utilised as “layers” to aid the communication of the design with the addition of primary architectural representation such as Plan, Section and Axonometric.

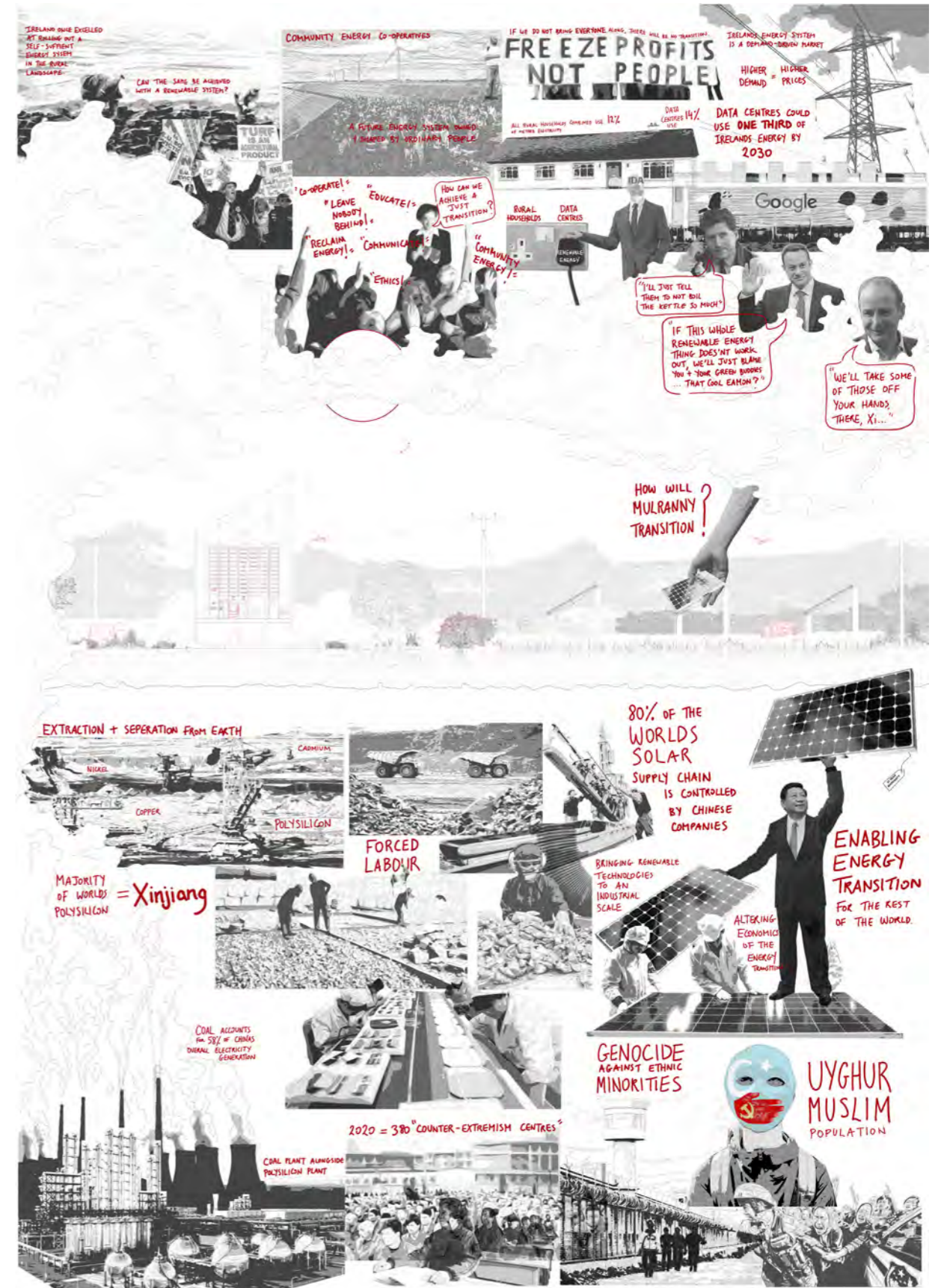
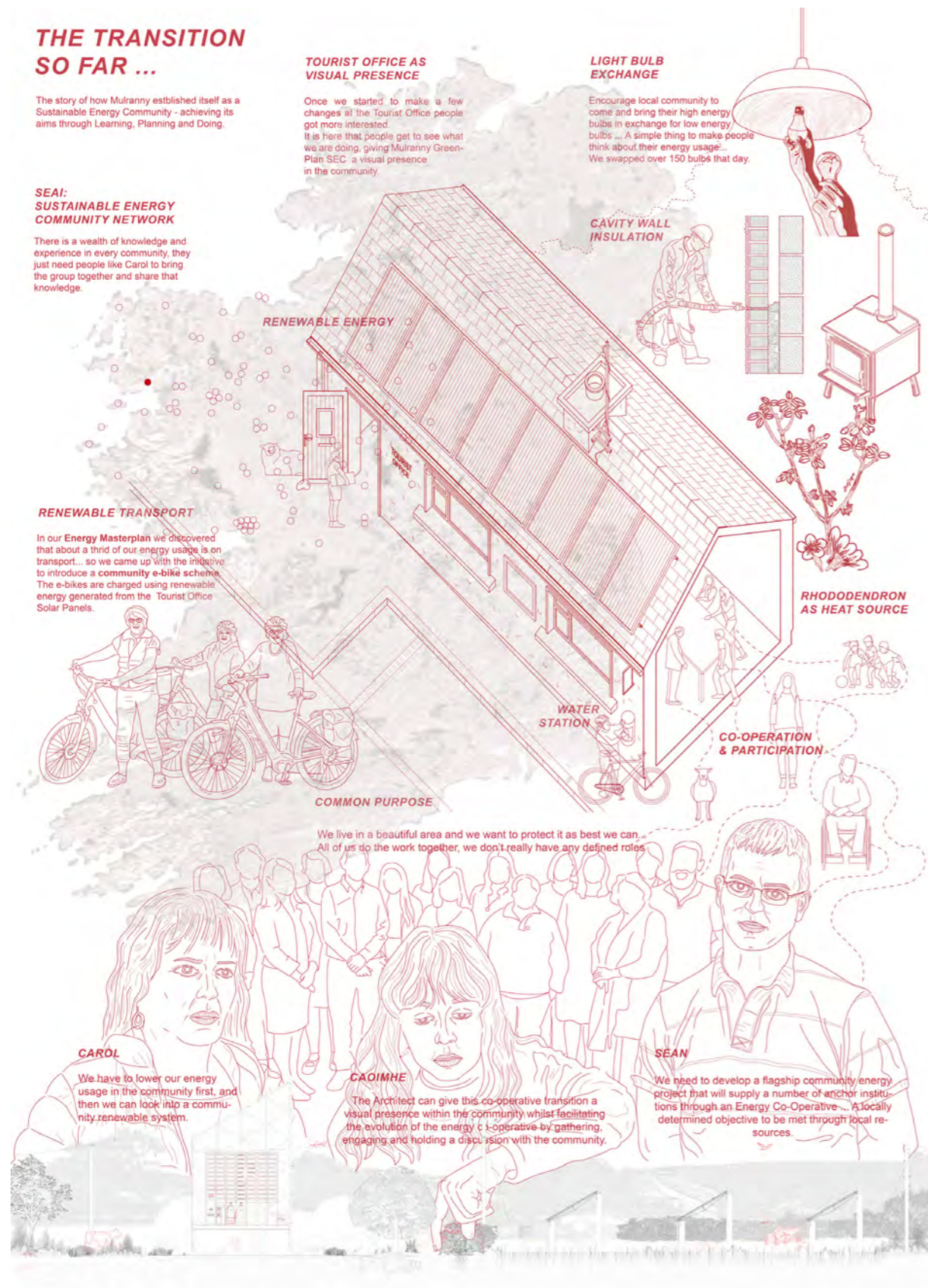


Fig. 10 Caoimhe Power, Framing: The Politics and Ethics of Solar, 2022.





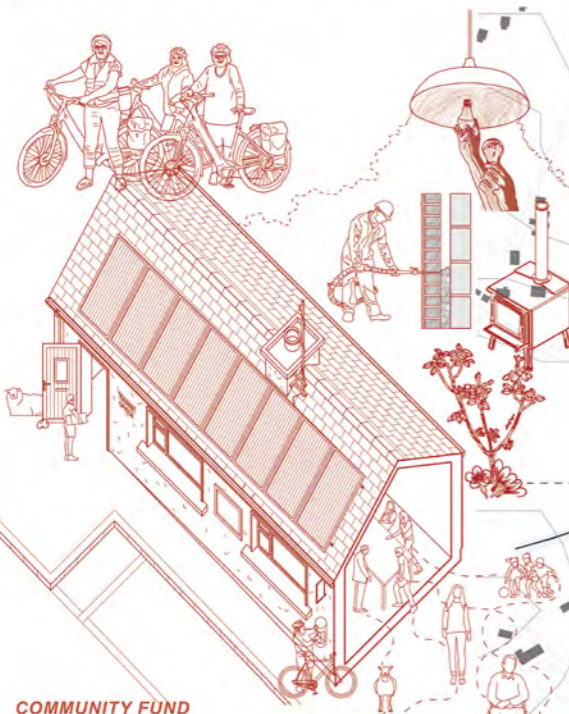
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Upon reflection, the drawings at this point in the research were evolving into an overly-diagrammatic and text reliant means of communication - a result of focusing on the community as the primary audience whilst simultaneously making assumptions of the community’s understanding and interpretation of architectural representation. Subsequently, the communication process evolved into that of explanatory drawing rather than appreciating the participatory. Participatory visual communications, such as drawing, photography, and video, “hold the inherent potential of painting a more nuanced depiction of lived realities, while simultaneously empowering the research participants and placing the agency literally in their own hands.” (Literat, 2013) It is important to communicate how the design proposal functions in conjunction with leaving room for speculation, interpretation and deliberation by community members - reiterating the fact that the design project is an instigator for giving the solar farm a visual presence, an actor in the commencement of the solar farm evolving into a conversation within the community, eventually leading to its initiation within the landscape.

Fig. 11 Caoimhe Power, The Transition So Far, 2022.

## THE CO-OPERATIVE

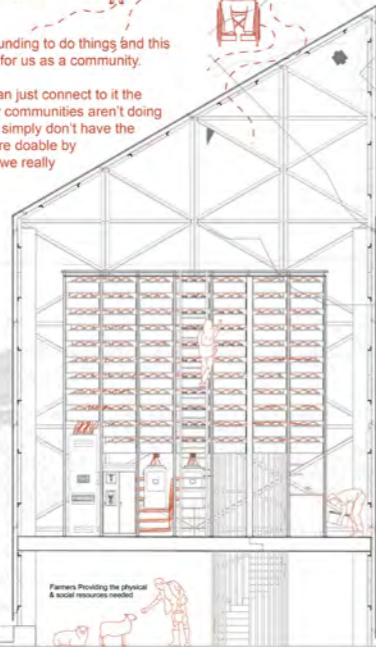
the co-operative model enables and advances that thinking of avoiding the limits of land ownership because the cooperative can transcend land ownership. Looking at it in a co-operative way, there are individuals that individually won't do a lot with it but if we prove resources on it visually and float this idea to interest people.



### COMMUNITY FUND

As a community we struggle for having funding to do things and this project can be absolutely transformative for us as a community.

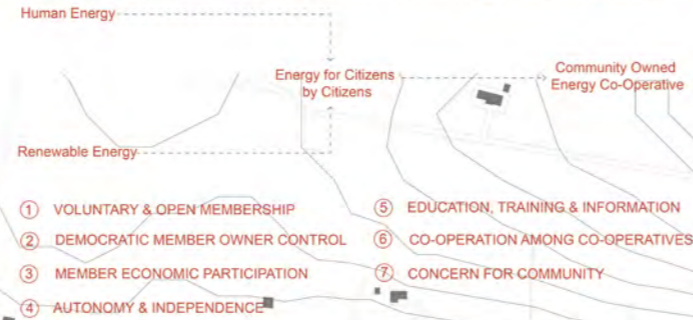
If there is capacity on the grid that you can just connect to it the solar farm is profitable. The reasons why communities aren't doing it is that they don't have capacity or they simply don't have the confidence. The likes of these projects are doable by communities but with some support and we really need to advance this.



Farmers Providing the physical & social resources needed

## MULRANNY ENERGY CO-OPERATIVE

An accessible, de-centralised, self-sufficient distribution of renewable energy embedded in a participatory co-operative network.



### VISUALISING THE SYSTEM

One of the lessons we've learned in the past is that when visualisation is done so well its extremely powerful.

It encourages other people to imagine what we've been thinking ... You get enthusiastic when somebody else shows you what is possible visually.

### LAND OWNERSHIP

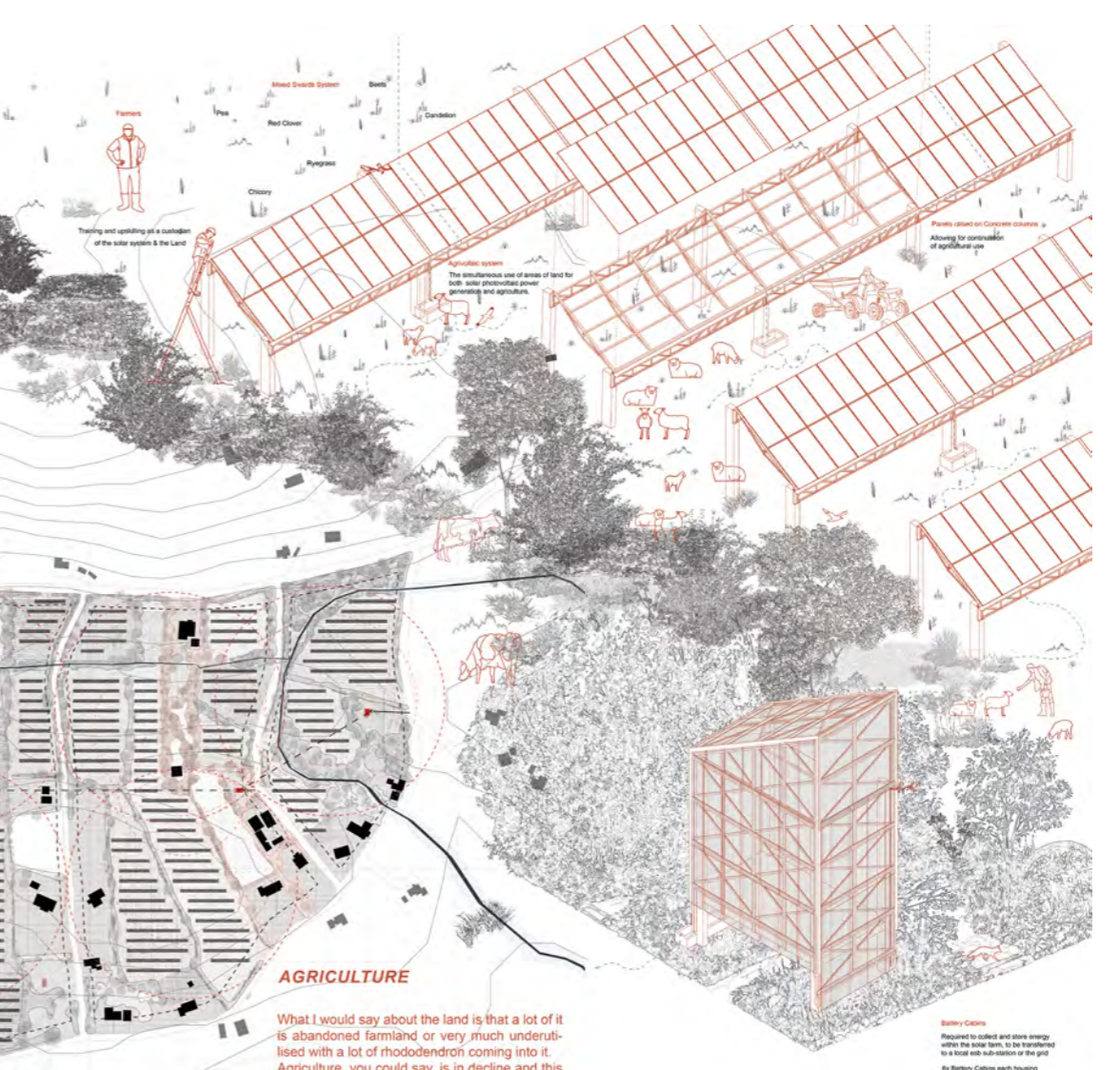
One of the fundamental principles of geodesign methodology is that you ignore land ownership in terms of design and that creates that freedom to look at the landscape *untattered* from land ownership so that is an important principle that we've used before.

### AGRICULTURE

What I would say about the land is that a lot of it is abandoned farmland or very much underutilised with a lot of rhododendron coming into it. Agriculture, you could say, is in decline and this represents an addition of adding value to that space - it can still be used for agriculture it can still be used for biodiversity, it can be invested in as a space in a very positive way.

### CHALLENGES

I don't think we would reach our targets without it. There is significant grid challenges and if we discover that the grid infrastructure is the disabling factor then it is important that we highlight that.



Establishing Natural Biodiversity Corridors within the solar system allowing for the free movement and habitation of birds & flora.

The natural corridors are creating microclimates which allow for the natural shelter and ventilation of the Battery Cables.

Fig. 12 Caoimhe Power, The Co-Operative, 2022.

In establishing a form of eidetic visual for the visualisation of the Solar Farm, previously captured photographs were layered behind “blank” perspectives of the solar structures - embodying a sense of the design project whilst allowing the audience to speculate and imagine this infrastructure within the landscape. Whether audience members are architects or people of the community, this type of imaging inaugurates engagement and participation with the evolving landscape - empowering and instilling agency in the community whilst alluding to the landscape being a narrative with a visual consequence. Hence, the architect brings more than agency, but rather, a plural skill in collating various aspects of different disciplines to progress the participatory and engagement processes of design within the community.

*View full Eidetic Montage here.*

Fig. 13 Video Clip of Eidetic montage film, Battery Cabin within the agricultural landscape, Caoimhe Power, 2022.



Fig 14. Eidetic montage film, Undercroft with familiar landscape of Mulranny.



Fig 15. Eidetic montage film, Undercroft with familiar landscape of Mulranny.

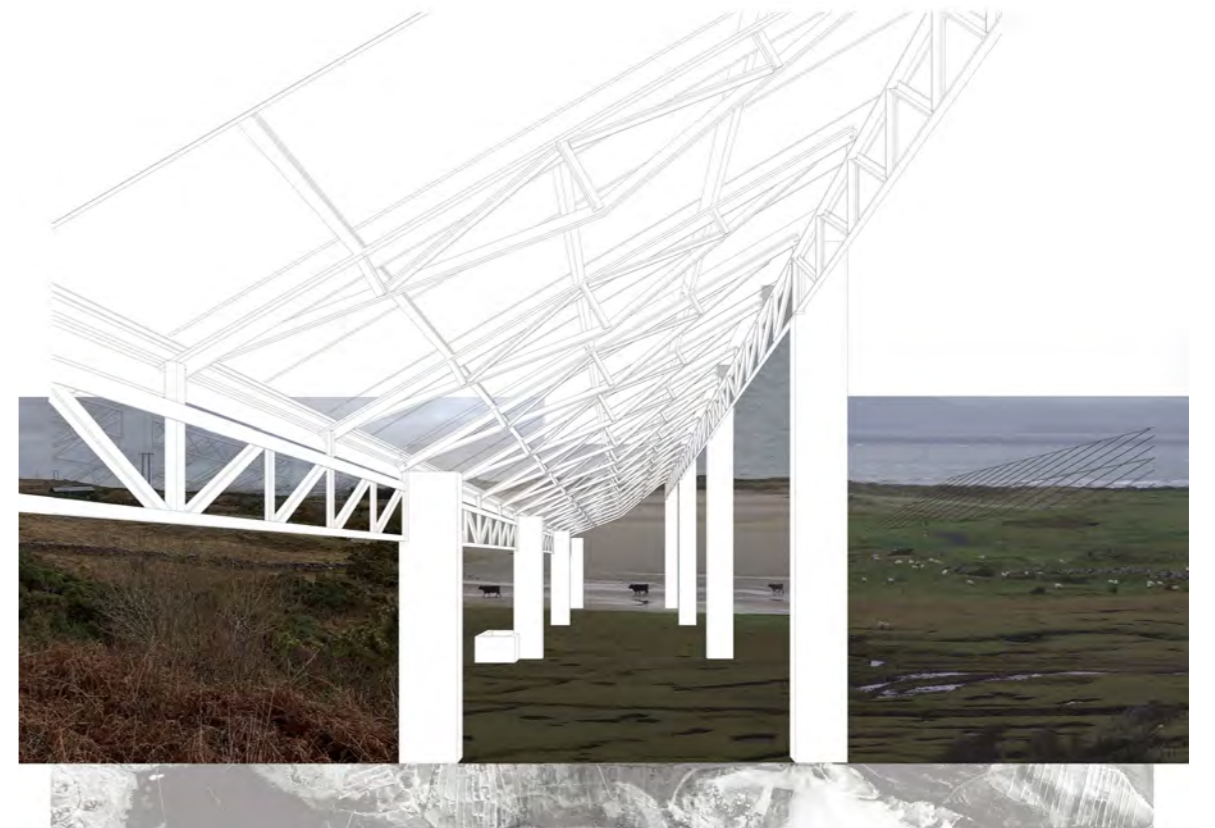


Fig 16. Eidetic montage film, Undercroft with familiar landscape of Mulranny.



Fig 17. Eidetic montage film, Columns within the agricultural landscape.

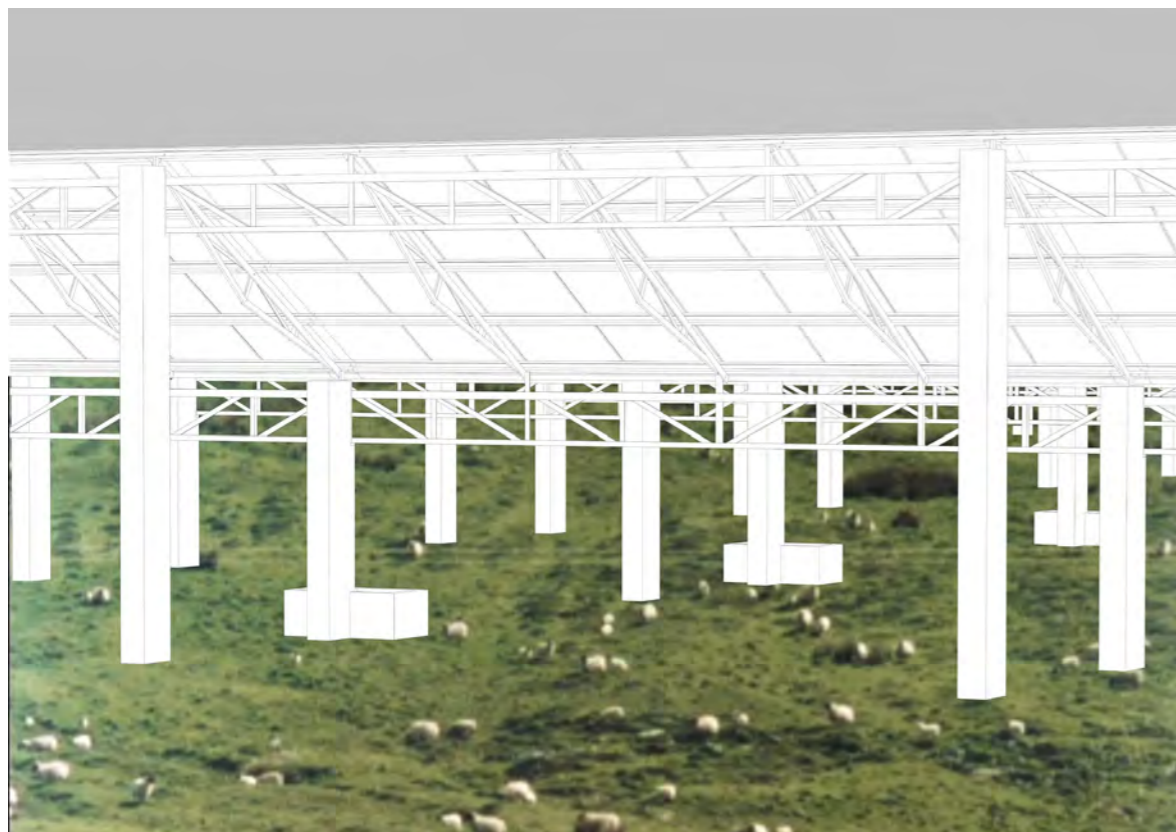


Fig 18. Eidetic montage film, undercroft of solar infrastructure with moving film of sheep underneath.



Fig 19. Eidetic montage film, Battery Cabin within the agricultural landscape.



Fig 20. Eidetic montage film, Solar infrastructure within the agricultural landscape.



Fig 21. Eidetic montage film, Solar infrastructure within the agricultural landscape.



Fig 22. Eidetic montage film, Solar infrastructure within the agricultural landscape.

## Designing & Assembling Participation

In order for drawings and image to act to their fullest ability in engaging and enabling participation, they required careful mediation between their speculation, communication and interpretation. Too much explanation and information could limit the scope of the creative output of the participatory process whilst not enough can result in a lack of definition and clarity, leading to a lack of engagement and enthusiasm. Participants needed to feel a familiarity with the landscape, whilst being able to recognise the potential for a new infrastructure to evolve within it. Thus, participation needs to be designed into drawing and images, rather than being a *er-the-ma er*. As previously mentioned, due to the limitations involved in the scope of this research, rather than conducting the participatory process, as the architect I design the participation. The resultant participatory drawings require the skill of the architect - equipping the community with the necessary design, information, and visualisation tools to empower them as custodians of this solar landscape.

Mulranny has already taken part in geodesign workshops as part of creating a community plan. “Geodesign is a methodology for planning large-scale urban and landscape settlements ... and used to design and evaluate how to plan and design future settlements.” (Custom Architecture)

This process involved a mix of 30 participants – community, local authority, architects, landscape, heritage, ecology, and environment specialists. The proposals and projects were exhibited publicly within which a public ballot of proposals was taken – negotiating the final negotiated design for Mulranny. “The resultant package can be used a template for future planning in Mulranny.” (Custom Architecture) Therefore, it is necessary that the findings of this research and methods employed become a “package” for future participation in Mulranny. Throughout the research process, it became apparent that a more elective approach to participation was necessary. This could take the form of online engagement through surveys, questionnaires and online mapping tools or the installation of participatory interfaces as part of an exhibition – inviting people to participate and engage whilst allowing a degree of anonymity. This exhibition would become the “playground” within which negotiation, deliberation and participation become part of this democratic engagement process.

## Work Booklet

The question of how people would participate and how their contributions would be collected in order to inform the future of this research came into play. A book of “exercises” that provoke and engage participants, no matter what their background is, would allow for contributions and interpretations to be suggested whilst also allowing the participation to be elective. These “exercises” could take the form of sketching over maps, creating maps, offering solutions to how an energy co-operative could work, how agriculture could work alongside the solar farm etc. In order to participate, one simply uses a pencil on paper to engage with and contribute to the research.

In *Land for the people; The sexual case for land reform in Ireland* Eimear Walshe utilises a variety of exercises to “help us come to greater insight, consciousness, and agency in relation to such matters.” (Walshe,2021) They use multiple choice, question and answer and drawing exercises to engage yet let users contribute to the work. The questions asked give guidance to the user as to the context and what choices they have as a result – allowing for people to learn about the topic whilst gaining their interpretations.

This work inspired *The Community Energy Co-Operative Workbook*, which aimed to gain insight whilst instigating an informed curiosity and

conversation surrounding the implementation of a community solar farm, immersing one into the various perspectives involved. The format takes that of drawing exercises and questionnaire style provocations – allowing one to “fill the shoes of select personalities affected by the solar farm whilst contributing to interpretations on such projects. This workbook is a design tool with which the audience of the exhibition can physically interact with and, thus, inviting them to participate rather than spectate.

The workbook also attempts to ascertain the level of participation amongst landowners and farmers on the designated site for the community energy co-operative solar farm, as seen in exercise 1. The level of participation amongst this particular group ultimately dictates the size and placement of the proposed solar farm, and in turn, the amount of energy the community has access to. Reflecting on this, it became evident that varying degrees of participation needed to be communicated back into the community, thus, revisiting the design and construction project of semester 2 and bringing the research full circle.





Fig 23. Eimear Walshe, Exercise 1, The Land For The People: The Sexual Case for Land Reform in Ireland, 2021.

**EXERCISE 1**

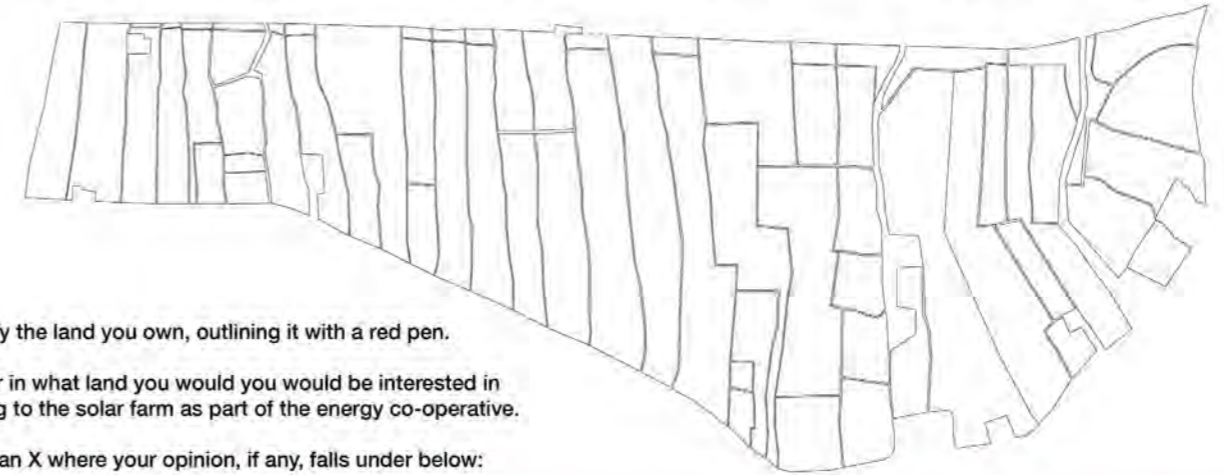
You are the youngest daughter in a family of 12. You have decided it is time to consummate your love with a local young lad. You are not allowed to marry him because you come from a 33-acre farm and he comes from a 19-acre farm.

Select one of the following options:

1. Wait for your parents and eleven brothers to die, inherit the house at eighty years old and marry your love ( )
2. Marry an older man with a 50-acre farm and sneak your love in when the occasion arises ( )
3. Run away to America with your love and consummate once you earn enough to rent ( )
4. Resort to the hayshed and learn abortifacient witchcraft ( )
5. Kill your parents and eleven brothers unsuspectingly ( )

**EXERCISE 1**

Place an X in which category you fall under, if any:



Identify the land you own, outlining it with a red pen.

Colour in what land you would be interested in leasing to the solar farm as part of the energy co-operative.

Place an X where your opinion, if any, falls under below:

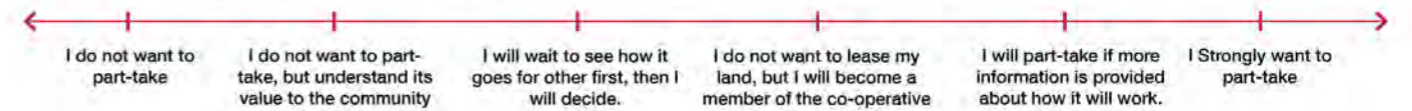


Fig 24. Exercise 1, The Community Energy Co-Operative Workbook, Caoimhe Power, 2022

**EXERCISE 2**

You are a land owner leasing your land to the new solar farm as part of the Energy Co-Operative. You have decisions to make in regard to how the land is used with the Solar Farm.

What is your decision?

1. Leave the land idle so nature and biodiversity can thrive, allowing the land to regenerate itself. ( )
2. Continue leasing the land and let the farmer decide what they want to do. ( )
3. Graze sheep underneath the Solar panels, they seem to provide suitable shelter. ( )
4. Allow the local Old Irish Goat sanctuary to use the land for the native Old Irish Goat herd. ( )
5. Use the land for multi-species / mixed swards systems to regenerate the land in conjunction with grazing sheep. ( )
6. You have been approached by a solar farm developer, offering a sizable sum for the lease along with a longer contract.( )

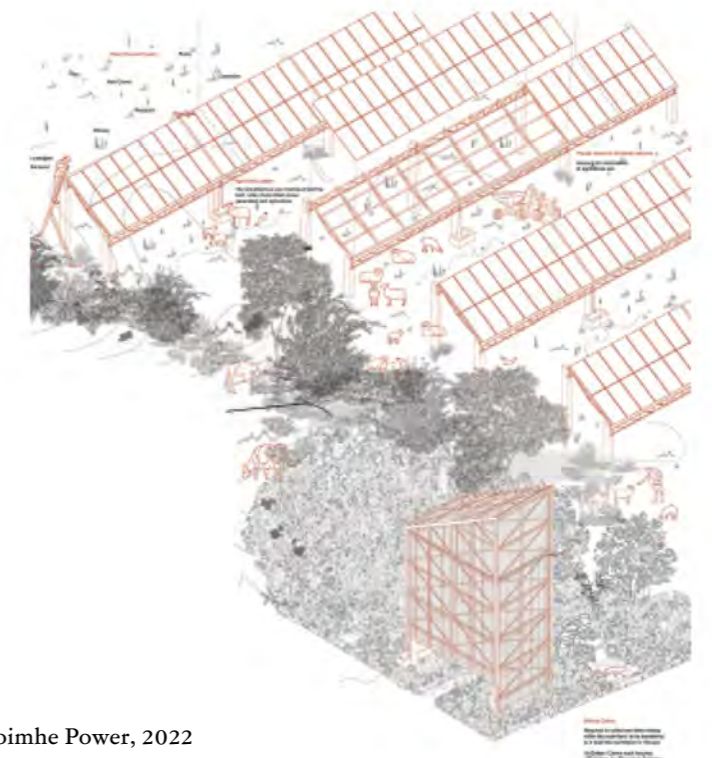


Fig 25. Exercise 2, The Community Energy Co-Operative Workbook, Caoimhe Power, 2022

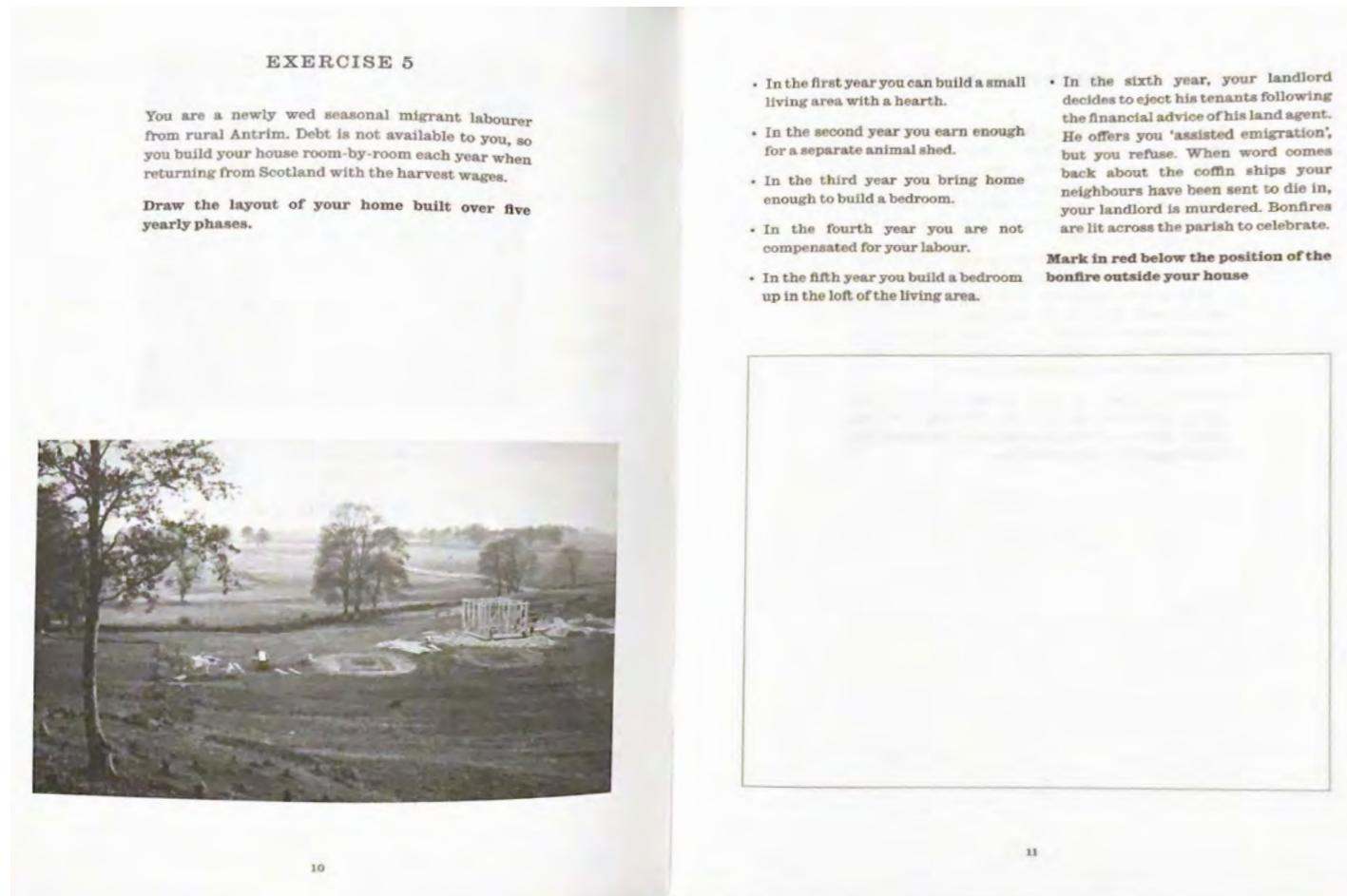


Fig 26. Eimear Walshe, Exercise 5, The Land For The People: The Sexual Case for Land Reform in Ireland, 2021.



You are an Old Irish Goat, an endangered breed of goat that usually roams the commonage with your herd. The sanctuary have a contract with the solar farm to use some of the land for you and your herd.

What is your reaction?

1. Try to escape by jumping a fence, after all, I am able to jump up to 2 metres high ( )
2. There are no rocks or hills to jump on, I will jump on the solar panels as an alternative, maybe thats what they are for? ( )
3. These solar panels seem like a good place for shelter, a much better alternative to going into the village. ( )
4. There are no houses here for me to eat the garden plants, but these mixed swards are tasty. ( )
5. I see sheep in the next field, I hope they do not come over and eat our food ( )
6. I like to sleep under the battery cabins as they are in a nice secluded area and they even come with their own water trough! ( )

Fig 27. Exercise 4, The Community Energy Co-Operative Workbook, Caoimhe Power, 2022

EXERCISE 10

It is 2055. The Solar farm was successfully implemented in 2030 but the solar panels are now getting old, having a 25-year lifespan.

Pick a speculative future for the solar farm:

1. A bad storm sweeps away all the solar panels, leaving them scattered in the feilds,hills, mounatins and sea. ( )
2. The solar panels meet the end of their life and the community decides to purchase replacement panels as energy poverty as spiralled out of control. ( )
3. The solar panels meet the end of their life and energy has become super-abundant throughout the country. The community does not need the solar farm anymore and the panels are sent to a recycling facility. ( )
4. Everything is sold or recycled so the community can invest in hydropower energy seeing as it has become more accessible and cheaper than in 2030, when solar was cheaper. ( )
5. With only the concrete columns and steel structures left in the landscape, the steel is reused for making sheds, gates and structures for the community ( )
6. The concrete columns are left in the feilds, supporting a few animal-shelter structures here and there. Nature takes over and they appear as if they were always part of the landscape . ( )

Sketch the speculative future you have picked below or sketch a speculative future not mentioned:

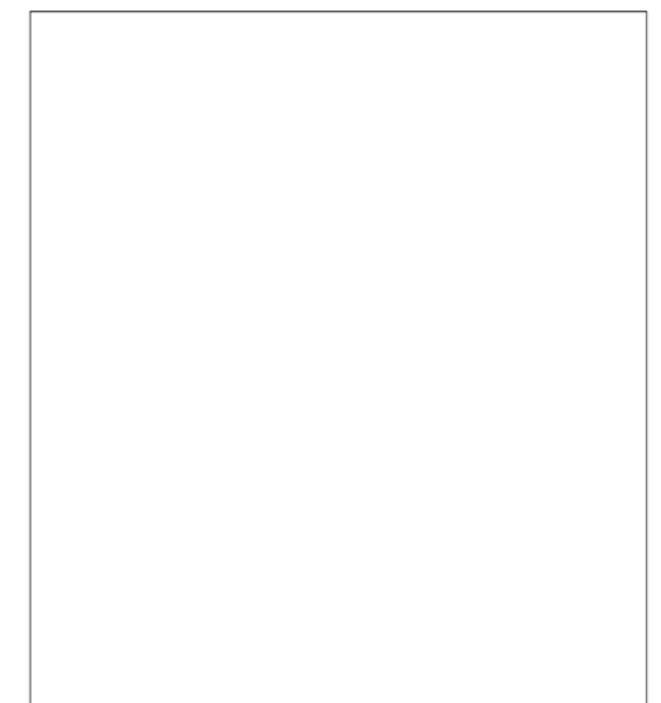


Fig 28. Exercise 10, The Community Energy Co-Operative Workbook, Caoimhe Power, 2022

## Design, information, and visualisation

### - equipping the community through elective design.

It had been established at this point in the research, from critical reviews with an architectural audience and from engaging with community members, that the community needed to be equipped with elective information in addition to the design of the solar farm and participatory methods established. However, the primary custodians of this solar landscape are ultimately going to be landowners and farmers, without their participation the community energy co-operative solar farm has lost its most vital resource – the Land. This is one of the primary challenges the community will face in the implementation of the solar farm, thus, highlighting this and visualising it back into the community is paramount to their understanding of the challenges inherent to community-based energy. In the initial Mulranny Decarbonisation Zone plan, the aim was to establish an 8MW solar farm across the designated 50-acre site in order to generate energy for 2,000 homes. This figure then reduced to 5MW in the Mulranny towards 2030 plan to provide power to 1,000 homes, with the current number of homes in Mulranny being 441, with 234 residential and 169 holiday homes. (Mulranny community action plan 2022) It became evident through the design and research of this project that these figures are unattainable due to the undulating landscape with its congested pattern of land ownership.



Fig 29. 5MW solar system plan, section and delivery, Caoimhe Power 2022.



Fig 30. 3.5MW solar system plan, section and delivery, Caoimhe Power 2022.

To equip the community with this information, four examples of participation were visualised in plan and section, along with infographics conveying the number of solar panels, landowner participation, battery cabins, community fund, energy production, the embodied carbon of each scheme. The 5MW scheme is the most intense version, with a total of 51,000 m<sup>2</sup> of solar panels. This results in it being the most carbon intensive option but allows for enough energy for 1,190 homes. However, when one looks at the section of this infrastructure through the landscape, the scheme is rendered inefficient due to overshadowing because of the landscape and, in turn, the solar panels overshadowing adjacent panels. In addition to this, 46 of 51 landowners are needed to participate, which could be a challenging thing to accomplish with such an intense infrastructure. Even when reduced to 3.5MW in order to avoid problematic areas of land, similar problems of intensity, and landowner participation arise. It is here, one may ask what would it look like if the community energy co-operative solar farm were to concentrate on providing enough energy for Mulranny itself for the next 25 years?

The 1.5 MW scheme requires 9 of 51 landowners to participate, producing enough energy for current residential figures and cutting the embodied carbon down from 17,008,194 kg CO<sub>2</sub>e (5 MW) to 4,759,870 kg CO<sub>2</sub>e. This could then evolve over time with more participation and success into a 2.5 MW scheme. This allows the energy co-operative to react to population expansion and increased energy requirements during the lifespan of the solar farm, in addition to an increased knowledge on its implementation from their experiences with the 1.5 MW scheme and an increased access to advanced solar energy technology. This elective information communicates both the limitations and aspirations of each option, ultimately visualising the wider impact of such infrastructure to the community whilst underlining the value of participation from the agricultural community.

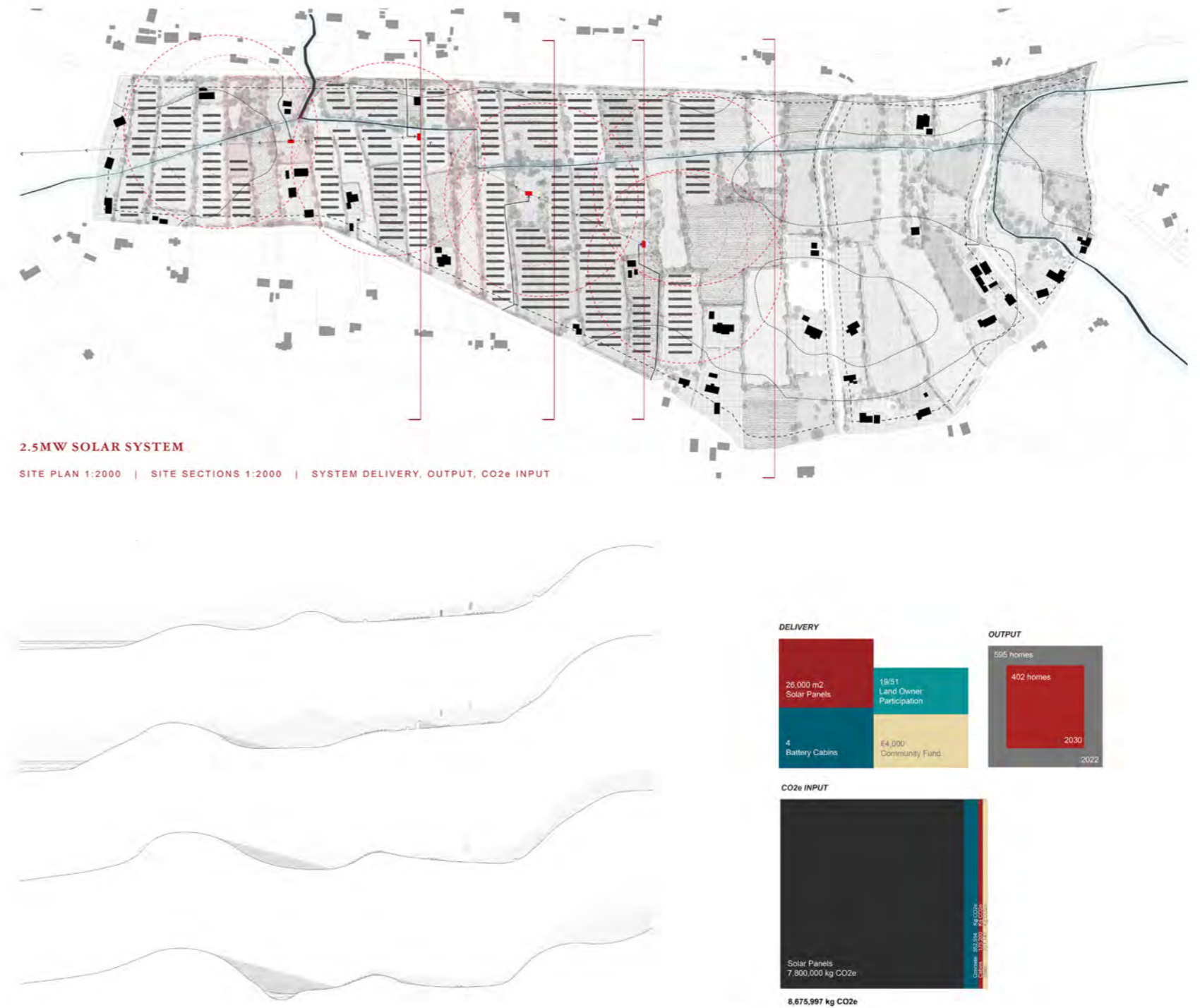


Fig 31. 2.5MW solar system plan, section and delivery, Caoimhe Power 2022.

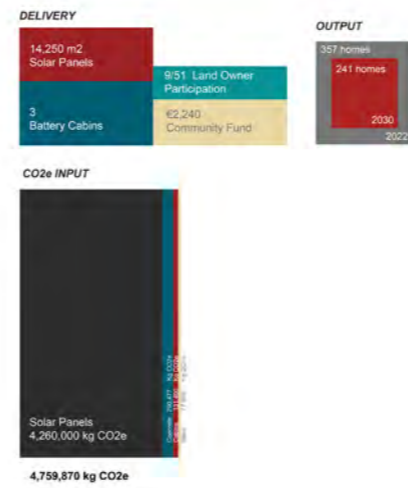
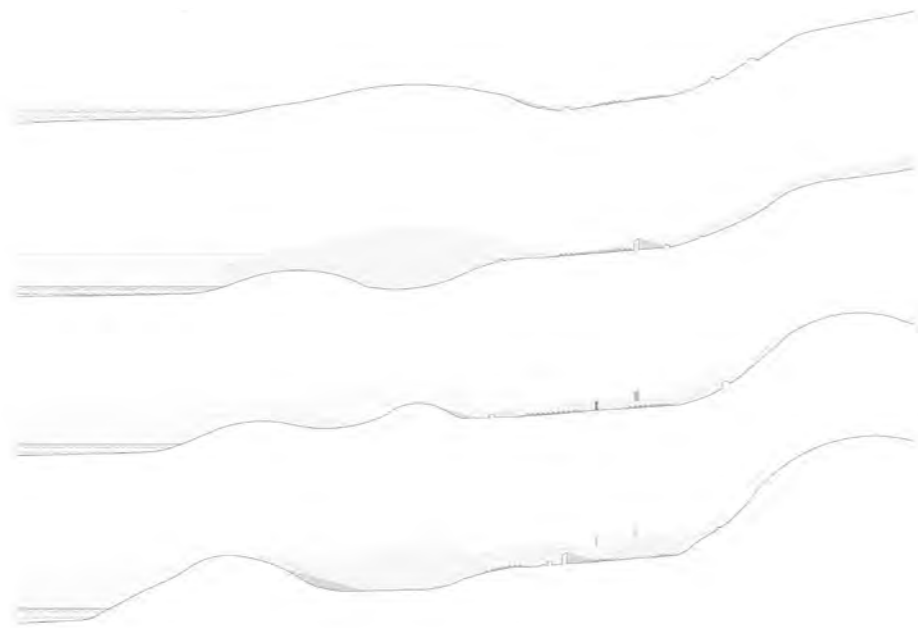


Fig 32. 1.5MW solar system plan, section and delivery, Caoimhe Power 2022.

### Challenges, Policy & the Custodian:

The biggest challenge facing Mulranny in implementing this community-based energy system is connecting to the grid, with concerns regarding existing infrastructure not being sufficient to undertake this connection and export excess energy to generate revenue for the community: “There is significant grid challenges and if we discover that the grid infrastructure is the disabling factor then it is important that we highlight that.” (Sean Carolan, 2022) In addition to this, Farmers and landowners are facing challenges in terms of policy relating to solar energy generation and grant aid. The Targeted Agricultural Modernisation Scheme 3 provides up to 60% in grant aid for qualified farmers on solar infrastructure investment, however, when investigated further, grant-aided solar panels may only be used to produce energy for the farm on which it is installed. (Cadogan, 2022) (Ryan, 2022) This means any excess energy produced is wasted rather than exported to the grid and without any profitable enticement to invest in such infrastructure, farmers are being encouraged to look elsewhere and collaborate in a community energy setting. If policy were to allow for renewable energy to be harvested and exported by farmers to a co-operative community setting, communities such as Mulranny have the potential to curb grid connection challenges whilst utilising and adding value to agricultural resources. The farmers become the primary facilitators of such a collaboration – providing the necessary resources, being qualified to apply for grant aid and potentially being the custodians of this solar landscape by constructing, maintain-

-ing, and advancing the infrastructure along with other agricultural enterprises such as sheep grazing.

To show the effect of the solar panel infrastructure on the ground in relation to the custodian, the constructional logic of this is drawn in section – showing possible methods of construction by the custodians, allowing for them to elect which construction method to undertake on their parcel of land. This licenses a return to semester 2, looking back and reflecting on this part of the project as a method of construction. This also allows for an exploration of less carbon-intensive models of construction when compared to the semester 2 design project – a method of construction heavily reliant on concrete and steel due to large spans and the existing use of such materials and structures in Irish agricultural settings.

**2.**

Gabion Basket Ballasted

Scaffolding.

Rainwater trough at both ends of solar array.

800 mm height & 3m spacing.

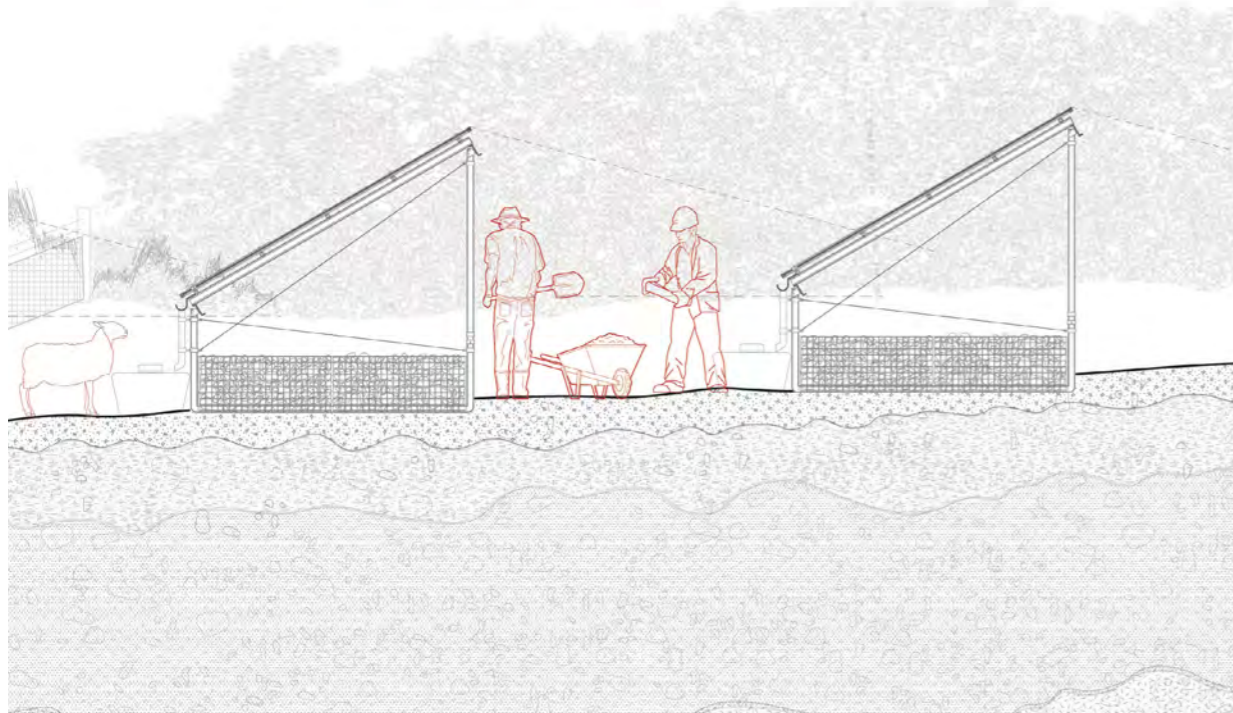


Fig. 34 Custodians of the solar landscape, Gabion basket Ballasted Solar System type, Caoimhe Power, 2023.

**5.**

Drilled Cast-In-Place Concrete Pier

Steel Angle Frame with Truss system.

Integrated Rainwater trough.

1200 mm height & 7.5m spacing.

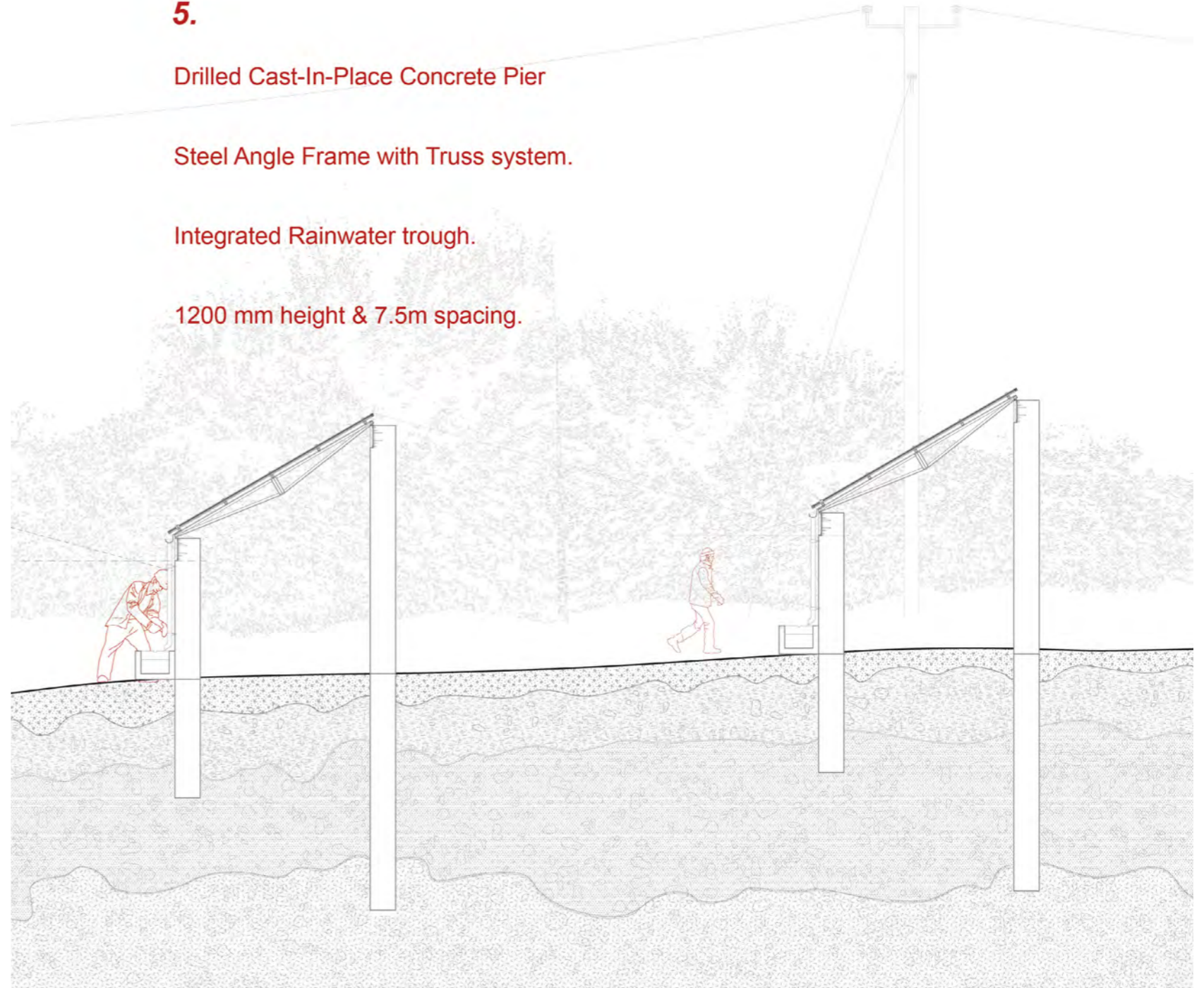


Fig. 35 Custodians of the solar landscape, Semester 2 Concrete drilled cast-in-place pile with steel angle frame Solar System type, Caoimhe Power, 2023.



Varying types of structural frames are explored along with foundation designs that attempt to utilise less concrete, resulting in varying structure heights that address both the human and non-human scale. Ultimately, this drawing visualises a revision into a more accessible and familiar method of construction for the custodians, rather than that of a bespoke construction requiring external developers and specialist machinery.

**CUSTODIANS OF THE SOLAR LANDSCAPE.**

It had been established at this point in the research, from critical reviews with an architectural audience and from engaging with community members, that the community needed to be equipped with *elective information* in addition to the design of the solar farm and participatory methods established. However, *the primary custodians of this solar landscape are ultimately going to be landowners and farmers*, without their participation the community energy co-operative solar farm has lost its most vital resource – *the Land*.



**THE FARMER:  
PRIMARY CUSTODIAN OF THE SOLAR LANDSCAPE.**

**AGRICULTURAL CHALLENGES:**

Farmers and landowners are facing challenges in terms of *policy* relating to solar energy generation and grant aid. The *Targeted Agricultural Modernisation Scheme 3* provides up to 60% in grant aid for qualified farmers on solar infrastructure investment.

> When investigated further, grant-aided solar panels may only be used to produce energy for the farm on which it is installed.

> Any *excess energy produced is wasted* rather than exported to the grid.

**COMMUNITY CHALLENGES:**

The biggest challenge facing Mulranny in implementing this community-based energy system is *connecting to the grid*, with concerns regarding existing infrastructure not being sufficient to undertake this connection and export excess energy to generate revenue for the community:

*“There is significant grid challenges and if we discover that the grid infrastructure is the disabling factor then it is important that we highlight that.”* (Sean Carolan, 2022)



**THE COMMUNITY:  
PROVIDES A CO-OPERATIVE NETWORK FOR  
ENERGY PRODUCTION + CONSUMPTION.**

**A REVISION OF POLICY:**

If policy were to allow for renewable *energy to be harvested and exported by farmers to a co-operative community setting*, communities such as Mulranny have the potential to curb grid connection challenges whilst utilising and adding value to agricultural resources.

The *farmers become the primary facilitators of such a collaboration* – providing the necessary resources, being qualified to apply for grant aid and potentially being the custodians of this solar landscape by constructing, maintaining, and advancing the infrastructure along with other agricultural enterprises such as sheep grazing.

<b>THE FARMER</b>	+	<b>THE COMMUNITY</b>
THE LAND GRANT AID CONSTRUCTION MAINTENANCE		THE CO-OPERATIVE ENERGY CONSUMPTION KNOWLEDGE BASE COMMUNITY GRANT AID

THE COMMUNITY ENERGY  
CO-OPERATIVE  
+  
AGRO-PV SOLAR FARM

A COLLABORATIVE ENDEAVOUR TO HARVEST ENERGY ON A SOLAR LANDSCAPE, FOR THE COMMUNITY OF MULRANNY.

**2.**

- Gabion Basket Ballasted
- Scaffolding.
- Rainwater trough at both ends of solar array.
- 800 mm height & 3m spacing.

**1.**

- Backfilled Cast-in-place concrete footing
- Timber frame, with aluminium mounting system.
- Rainwater trough at one end of solar array.
- 600 mm height & 3m spacing.

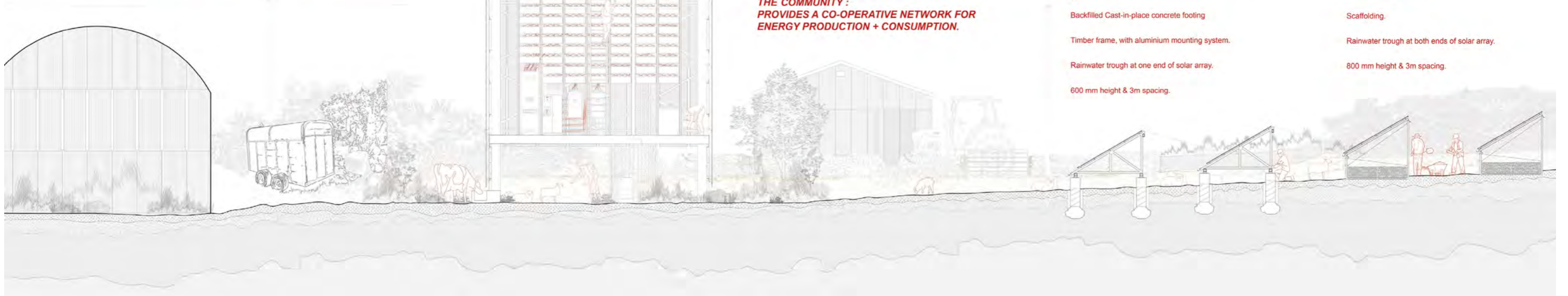


Fig. 36 Custodians of the Solar Landscape, Caoimhe Power, 2022.

Continuing foundation designs that attempt to utilise less concrete, resulting in varying structure heights that address both the human and non-human scale. Ultimately, this drawing visualises a revision into a more accessible and familiar method of construction for the custodians, rather than that of a bespoke construction requiring external developers and specialist machinery. Continuing the participatory and elective process through this drawing, the community becomes empowered with access to this information, communication, and education on the constructional logic of this infrastructure.

**CONSTRUCTIONAL LOGIC:**

To show the effect of the solar panel infrastructure on the ground in relation to *the custodian*, the constructional logic illustrates *possible methods of construction by the custodians*, allowing for them to *elect which construction method to undertake on their parcel of land*.

This allows for an *exploration of less carbon-intensive models of construction* when compared to the semester 2 design project – a method of construction heavily reliant on concrete and steel due to large spans and the existing use of such materials and structures in Irish agricultural settings.

CONSTRUCTION		VARIABLES			
FOUNDATION TYPES.	FRAME TYPES.	RAINWATER COLLECTION.	HEIGHT.	SPACING.	
Steel: Driven Pile / Earth Screw / Helical Pile	Steel frame: utilising members used in Agricultural shed construction.	No rainwater collection.	4000mm - Large machinery can continue farming practices underneath panels.	7.5 m - Space for large machinery to move through the landscape and continue agricultural practices, allows for limited/no over-shadowing of solar infrastructure, reduces amount of solar panels per hectare when compared to other spacing options.	
Concrete: Drilled Cast-In-Place Concrete Pier	Aluminium Solar Mount Kit: Typical ready-to-go solar mounting system	Rainwater collected in troughs at one end of system, expanding to both ends depending on surface area.	2100 mm - Humans, Animals, Light machinery	4 m - Limited space for agricultural machinery, requiring lighter and smaller machinery and limited continuation of agricultural practices other than grazing, increases amount of solar panels per hectare but increases risk of overshadowing, resulting in an inefficient system.	
Backfilled cast-in-place Concrete footing	Scaffolding: used in construction industry	Rainwater collected at trough in middle of system.	1200 mm - Animals can walk under freely.	6 m - Space for typical agricultural machinery i.e tractors to move through the landscape and continue agricultural practices, allows for limited over-shadowing of solar infrastructure, reduces amount of solar panels per hectare.	
Ballasted / Block Foundation	Timber frame: with aluminium mounting system.	Rainwater collected at integrated trough, designed into system of foundations.	800mm - Animals can crouch underneath for access.	3 m - Space for small machinery i.e Quads and grazing is only agricultural option, increases amount of solar panels per hectare but results in complete overshadowing of system, resulting in limited to no energy production.	
Alternative: Gabion basket ballasted					



Fig. 37 Custodians of the Solar Landscape, Caoimhe Power, 2022.

## Exhibition

This form of exhibition invites diverse audiences to participate, acknowledging the engagement of both community and architects in addition to the wider population – allowing for a diversified combination of interpretations and contributions.

The space between the eidetic drawings, eidetic films and solar system comparison board is a place for negotiation between audience members. In addition to this, it can be utilised as the primary space of participation and engagement in conjunction with the *The Community Energy Co-Operative Workbook*. In order to invite people to participate with these methods, this space needs to be one of contemplation as well as negotiation and conversation – a place where one can sit, be in the presence of the research surrounding them, conversing with the person beside them whilst part-taking in the workbook before pondering as to which proposed solar system option would best suit Mulranny to meet its aims and needs. The revised *Method and Direction* (fig 38) illustrates the use of the methods explored throughout the research and how these research outputs can be implemented as an exhibition for an architectural audience whilst easily implemented in Mulranny in a space of community, such as the tourist office.

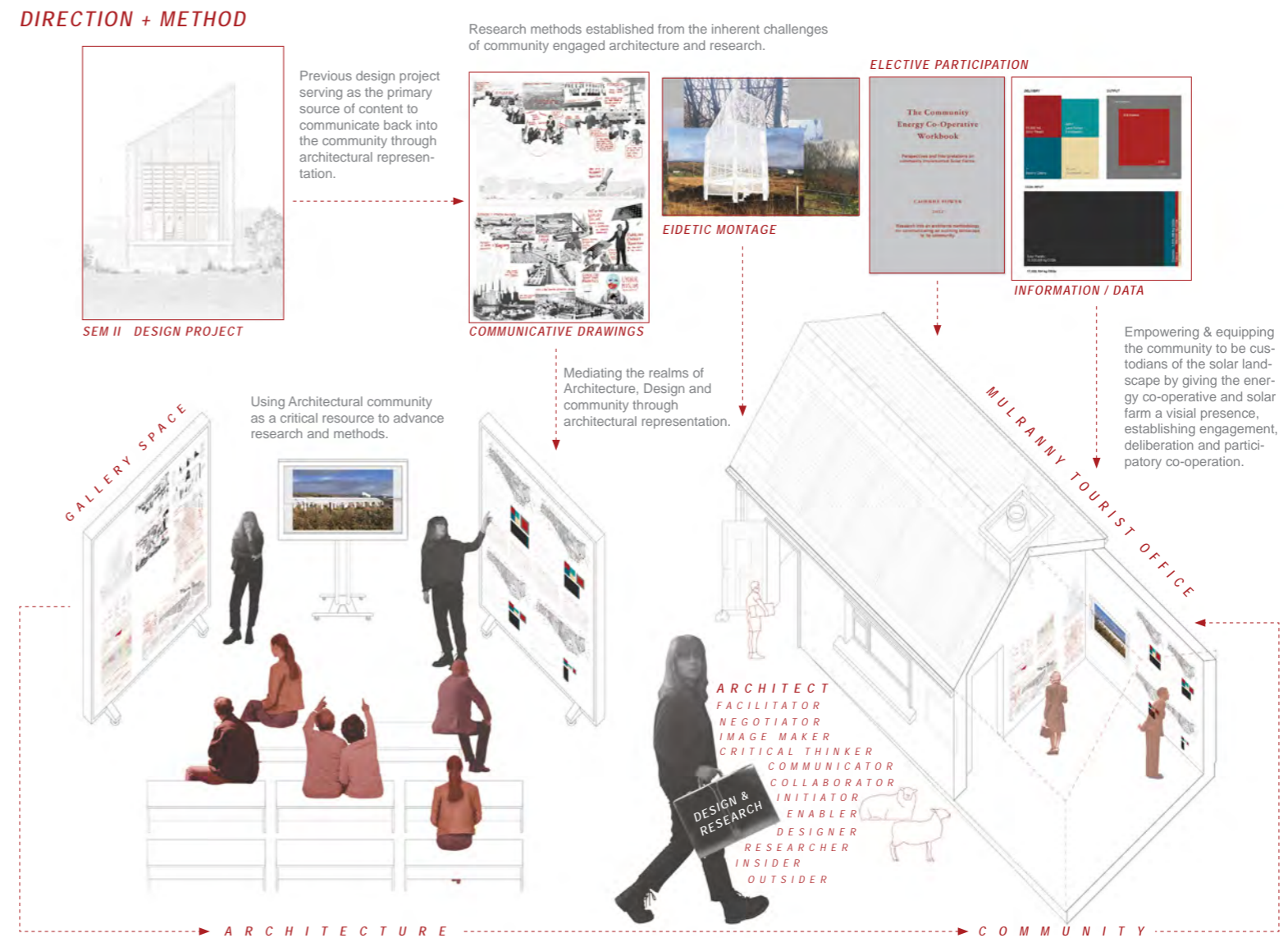


Fig 38. Revised Method and direction, Caoimhe Power, 2022.

## Conclusions & Reflection

### Defining an Architects role within the Community.

The role of the architect in community engagement processes is situational and place-based – dependant on the motivations and aspirations of the community involved. In Mulranny, it has been identified with community members that a visualisation of the solar farm is vital in communicating and promoting the future possibility of a community energy co-operative Solar Farm within its evolving landscape. The content produced as part of this research in conjunction with community members is primarily image based, resulting from the methods of interview, drawing and eidetic imagery. It could be argued that one does not necessarily need to come from an architectural education and/or profession to attain this level of communication and community engagement. However, if one did not take the initiative to design and speculate the energy co-operative, the number of solar panels required, the structure of the solar panels, the battery capacity required, the sheltering of those batteries, what land to use and what land to leave for biodiversity, how farming practices can evolve with the solar system, how farmers can be a part of this energy landscape and how the community will utilise it; then there would be no “content” to communicate.

In her PhD research, Melanie Dodd stipulates the various roles and personas of the Architect; The Local can understand and behave as designers from the point of view of the user, The double agent understands and utilizes the powers of agency as an architectural design tool, the educator recognises what design could be and why it matters to society, the artist provokes, operating materially and spatially to present the ordinary and extraordinary and the policy maker is ambitious for bigger ideas but acts within the concrete reality of the everyday. (Dodd, M. 2011) Thus, there are a multitude of roles that the Architect encompasses and within the diversity of these roles the architect composes themselves as a Collaborative Enabler – a person that makes something possible...who works together with others for a special purpose. (Cambridge Dictionary)

### **Reflection in action**

Reflection was a prominent part of the research throughout semester 3 - designing and making drawings each week, reflecting on those drawings, using this layer of reflection to inform the next drawing and/or output. This reflection in action aided me in reacting to the challenges that materialised through the process, with methods formulating as a result of this reflection-reaction. Each piece of work is a reflection on the previous piece, creating an iterative sequence of reflection that eventually brought the research full-circle back into the design project Semester 2. This made it apparent that semester 2 was a method in itself, one of construction and design. If the research were to continue, it would be developing and reflecting upon the drawing *catodians of the solar landscape* (pg 36) and continuing the process of elective design to achieve and prompt participation.

### **Reflection on action**

The initial proposed methods of research did not get a chance to occur due to the inherent challenges of community based research however, these challenges resulted in methods in reaction to them and show the nature of being an architect that bases themselves in community engaged

design. I placed myself in a plural position of architect, facilitator, negotiator, critical thinker, image maker, collaborator, enabler etc. (see pg 28) and in doing this I have been successful in establishing my position on what the role of the architect means in the 21st century and onwards. The two iterations of *Direction and Method* (see pg 6 and 28) show how the research and methods developed and reacted from the beginning of the semester to the end of the semester.

This research could continue on a collaborative basis with the community of Mulranny and allow me to continue to develop my perceived role as an architect. The research can be used as a model for future engagement projects involving energy co-operatives, community solar farms, community engagement as research in addition to informing architects on engaging with communities whilst addressing the challenges involved "...using architecture to solve problems of those beyond those relevant to architects themselves." (Cesal, E. 2010).

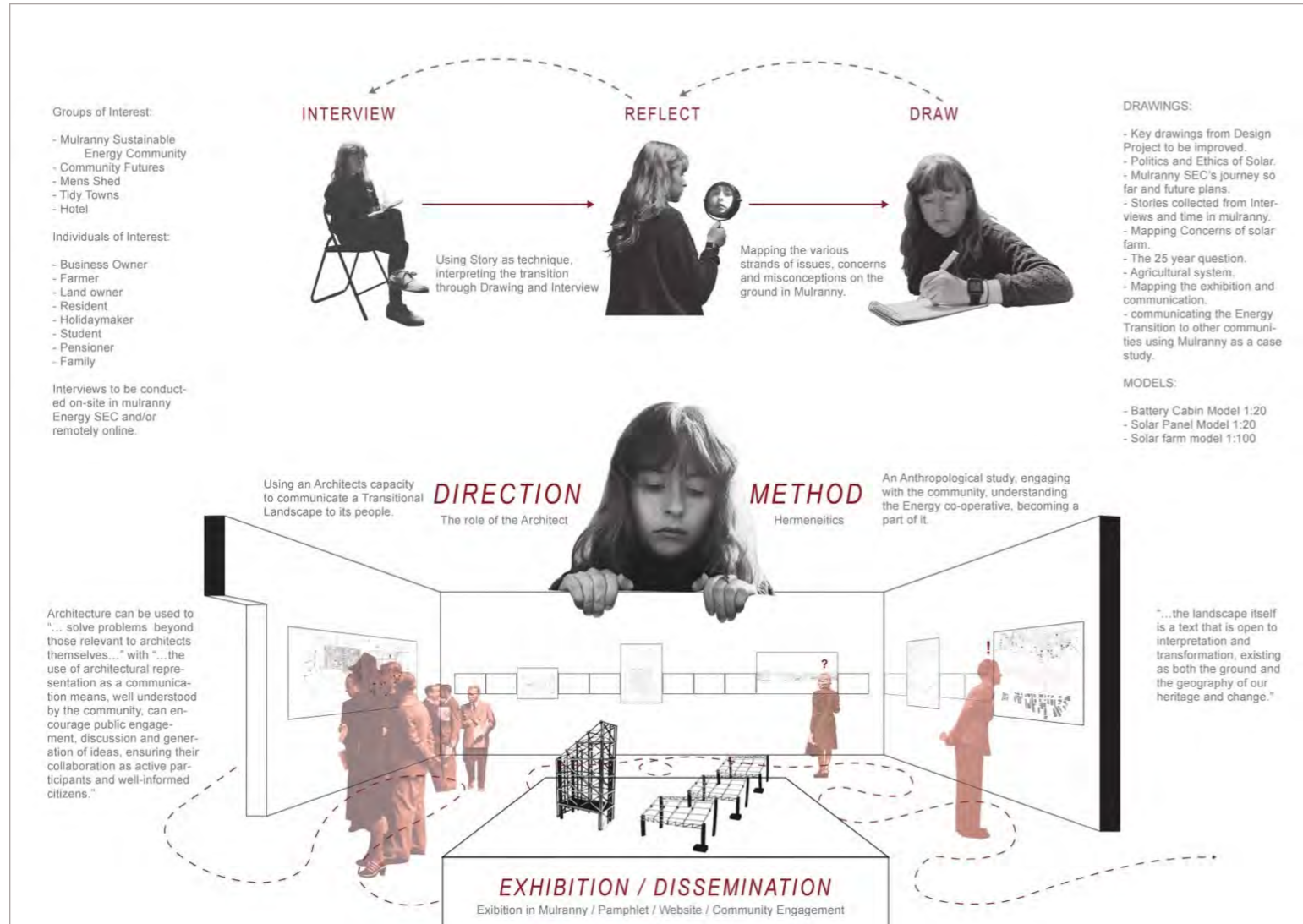


Fig. 6 Direction & Method, Caoimhe Power, 2022. Illustration establishing the methods to be employed as part of research.

**DIRECTION + METHOD**

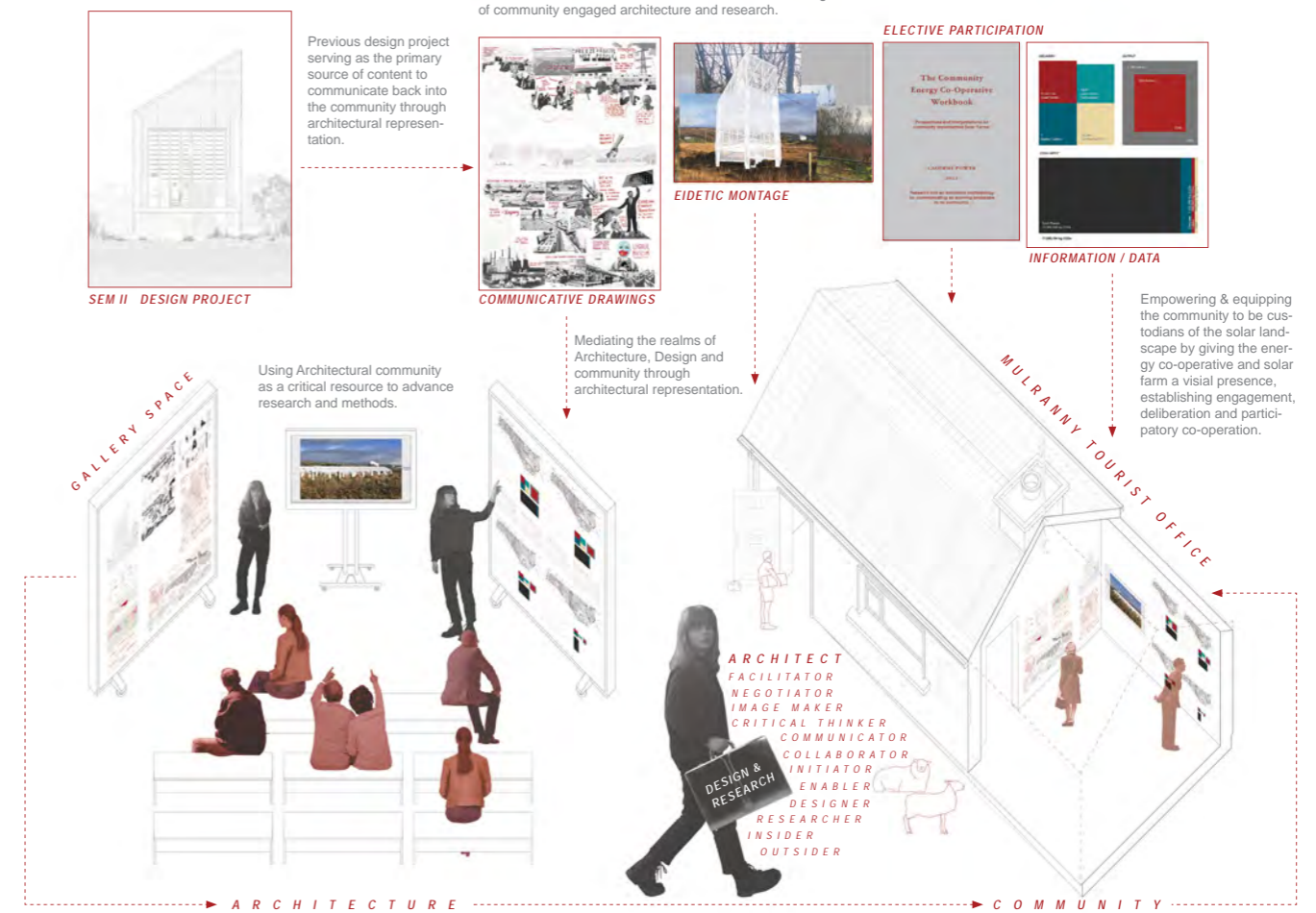


Fig 38. Revised Method and direction, Caoimhe Power, 2022.

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## **PART B - ADRS SUBMISSION**

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