Natural Energy Efficiency and Sustainability (NEES)

Draft Template for Pilot Projects

1. Description of the Project

This should be a general non-technical description and introduction to the Pilot Project

- Building/House type Family detached house
- Age of construction 28 years
- Other historical, architectural aspects
- Location Sisimiut, Greenland
- Nature of Works Wooden structure
- Promoter
- Funder Panbo Huse A/S
- Architect Panbo Huse A/S
- Builder Panbo Huse A/S
- NEES Products cellulose
- NEES Services
- Other relevant natural products or services

2. Contribution to Resource Efficiency

Deals with issues like energy efficiency and waste. Including the followings

Estimated energy savings resulting from the project (toe/year) (NEES indicator) in Kwh

Estimated carbon savings resulting from the project (tCO2e/year) in Ks kg

- Lifespan of the property- ease of repair, ease of upgrading, extensions, etc.
  - Expected lifespan is more than 30 years.
  - Boards at outer cladding can be replaced anywhere on the house. From window sills, insulation can be checked and refilled in case of breakage.
  - Replacement of windows can be done as usual. Windows can be moved further out to more commend depth.
  - Extensions are possible as at common constructions.

- Maintenance issues
  - Outer cladding can be repainted if wanted – not expected to be necessary the first 10-20 years.

- Percentage of materials which are recycled, reused
  - Insulation used for this building is EPS granules 100% recycled material from the dump and paperinsulation which is 88% recycled paper.

- Level of recyclability, reuse, biodegradability of materials
  - EPS granules can be collected and reused or burned.
    Paperinsulation can be burned or will perish in nature without doing any harm.
    Wooden boards can be recycled.
    Fiberboards can be recycled

- Are chemical/mechanical processes required in construction

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- No

- Environmental impact of construction/retrofit
  - None

3. Environment and Health

Section deals with issues like impact on climate change, bioregionalism, environment and human health, including the following:

- Percentage of materials used in the works are sourced from natural materials originating within the NPP region
  - As it is Greenland no of the applied materials has origin in the country.
- Carbon footprint of building (or/and extension) before and after works
  - Estimated Co2 was 7,8t pr year before rebuilding and is expected to be reduced to 4,4t pr year
- Details of compliance with building regulations, standards or other compliance certs
  - All building regulations according to Greenland building regulations are complied
- Human of environmental hazards in installation, use or disposal (end of life)
  - None
- Environmental impact of use
  - None
- Hazardous or polluting chemicals or substances used
  - None
- GHG emissions or other form of pollution resulting from installation or disposal
  - None
- Any likely health benefits better indoor climate
- Carbon capture potential of building
  - Expected (theoretical) 3,4t co2 pr year

4. Sustainability

Section deals with issues like sustainability of construction process, supply and distribution of materials, availability of services, impact on local culture, including the following

- Does the property and works relate to the natural environment and traditional built environment of its location
  - Yes. Different materials but usual look

- Origin of materials used in the construction and works
  - In general from Denmark

- Materials that have to be sourced from elsewhere, why and what is the

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impact of this
- The EPS insulation granule is produced local from local waste goods. Paperinsulation could have been produced if there is machinery present. The volume of materials needed for this method to add insulation on the building outside and renewing a climate shield is less than at traditional methods.

- Transport and importation issues
  - The volume of materials needed for this method to add insulation on the building outside and renewing a climate shield is less than at traditional methods.

- Procurement issues (taxes, levies, lack of local certification, etc.)
  - None

- Impacts (positive or negative) on design of products used
  - No comments

- Compliance with conservation legislation
  - No specific demands

- Availability of materials and skills to use and barriers to access.
  - Materials must always be shipped to Greenland, but all materials are available in Denmark. Only a short training is needed, so that local craftsmen are skilled to perform this method

5. Enterprise aspects

Section deals with institutional and financial issues, role of different enterprises, type of enterprises involved, institutional and financial barriers, other unique aspects, including:

- Estimated investment in carbon saving technologies as a result of the project (NEES indicator)
  - I don't know what this is!

- No. of social enterprises working in energy efficiency set up as a result of the project (NEES indicator)
  - I don't know what this is!

- Competent enterprises and viable financial options available?
  - To replicate the method all over Greenland there are maybe 100 companies and to pay for the work there is a few housing companies + some private homeowners

- Is model of construction replicable anywhere?
  - Yes

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- Are skills and material used normally available in the region
  - Yes

- Cost of works (e.g. per mtr2) and how does this compare to baseline costs
  -In Denmark the cost is about 1.200 Dkk pr m2 for standard buildings. This is about the same as other methods used so far – BUT NOTE: there are no other methods, that include both walls and basement insulation without thermalbridges.
  When annual savings in oilconsumption, a further lifespan for the building and improvement of living standard is compared to the cost of building a new house it is a reasonable investment to carry out this method of reconstruction/additional insulation
- Number of workers employed by project
  - Usually 2 workers for 0,8 hour pr m2 (at standard conditions)

- Estimated maintenance costs in future and how does this compared to baseline costs
- Outer cladding can be repainted if wanted – not expected to be necessary the first 10-20 years.

- Contractors who worked on project (private, social enterprise, volunteers, etc.) Private
- Business viability of these contractors
  - I don't know the meaning of this!

- Comparison to alternative approaches
  - I don't know the meaning of this!

- Barriers to replication (if any)
  - None

6. Scalability

Section deals with market potential of replicating model in light of current limits and importunities, and particular advantages and pitfalls to this approach, including the following:

- Is there likely to be significant demand for this model of works
  - Yes

- Skills and materials available to scale up the application of this model and to what extent
  - The method can be used in several applications – rebuilding as well as new constructions everywhere in the world where insulation is needed

- What would be required to make demand for this model increase

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significantly
- Promotion, marketing. Teaching in technical schools , architects magasines etc

- Can additional skills and products be sourced from other sources (e.g. outside region) if scaling up is needed?
  - There are products to be sold of commercial interests, but basicly it is about to think in this method in the future way of building insulated buildings.

- What subsidies have been used or could be used to roll out this model?
  - None, as far as I know

- What facilities, supports could be available to develop or improve this model?
  - Different technical engineers to make wizards, drawings, calculations etc and promotion and financially trained people

- How could it be developed or improved (e.g. as a self-build model)
  - "Do it your self- products" are also an option

- Are skilled technicians available to scale up this model
  - No

- Is accredited training available to scale up this model?
  - No

- Can such training be set up in a follow up action to NEES?
  - ??

- Are there any employment subsidies available for scaling up ?
  - No
- Realistic current potential of saleability

7. Conclusions

Section should contribute to developing a way forward for the NEES project and its objectives, by summarising the above points and states how the Project is relevant to the objectives of EES and how it demonstrates (or does not) the viability of use of natural and recycled materials and their services. It should also draw conclusions as to how NEES partners and other agencies can scale up and mainstream the benefits of the approach, and how this is consistent with European social, economic and environmental objectives. In particular:

- Can this example be seen as replicable model for zero waste construction/retrofit?
  - Yes

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- What particular elements in the Pilot are unique and worth developing
  - Insulation on a buildings outside WITHOUT Thermalbridges and WITH coherent insulation of recycled material, the ventilated climateshield and insulation on basement under groundlevel
- What specific issues or barriers does this model illustrate that require action
  - That too many buildings produce too much co2, because the buildings has not yet been rebuild by this method!
- How do you propose this model could be replicated or scaled up
  - The best and fastest way would be if a large company bought and took over the rights and put the method to the marked
- Specific proposals arising from the Pilot Project

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