

Reinforcing the resilience and self-reliance of communities in degrowth: The renewable energy workshop of 'Nea Guinea'

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Presentation Outline

1. Principals and goals of the project
2. Agents for empowerment and transition
3. The renewable energy workshop
 - Small wind turbine construction courses
 - Open source hardware research and development
 - Renewable energy installations
 - Environmental education
4. Social networks formed
5. Conclusion

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1. Principals and goals of the project: Community building

Autonomism, Social ecology, Permaculture, Degrowth

- **Earth care** - rebuild and sustain ecosystems
- **People care** - look after self, kin and community
- **Fair share** - set limits and redistribute surplus
- **Resilience** - communities which can absorb disturbance and reorganize while undergoing change
- **Self-reliance** - building community responsibility, decentralization of social, political, economic & technical authority
- **Self-sufficiency** - communal production and consumption of local agricultural and manufactured produce



Herbal medicine and herb cultivation in a community garden in Athens



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2. Creating agents for empowerment

- **Health workshop** - herbal medicine, soap making, therapeutic massage, Chinese medicine, yoga, herbal gardening, i.a.
- **Shelter workshop** - building with straw and clay (cob, straw-bale, rammed earth, i.a.)
- **Food workshop** - organic cultivation of vegetables, fruit tree orchards, beekeeping, beer brewing, i.a.
- **Clothing workshop** - sawing, knitting, clothes patterns, i.a.
- **Energy workshop** - off-grid electricity production systems with small wind turbines, small hydro turbines, solar panels, solar pumps



Photos from collective actions of the Food workshop

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3. Energy workshop: Overview of activities

Open source hardware (OSHW) designs

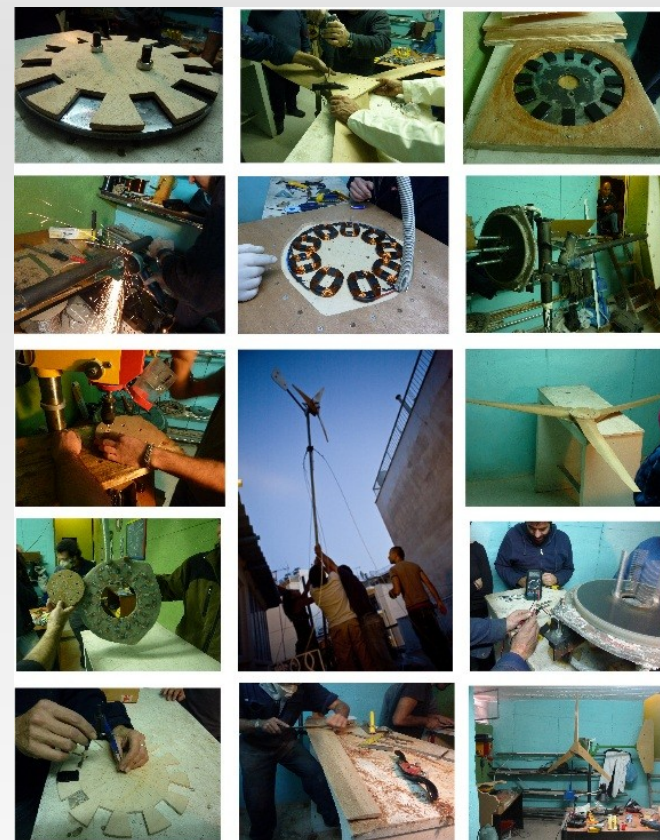
- Small wind and hydro turbine construction courses
- OSHW research and development

Off-grid systems for electricity production

- Renewable energy installations in rural projects
- Consulting on system design for rural projects
- Off-grid system design and installation courses

Environmental education

- Secondary and high schools, university
- Eco-festivals around Greece

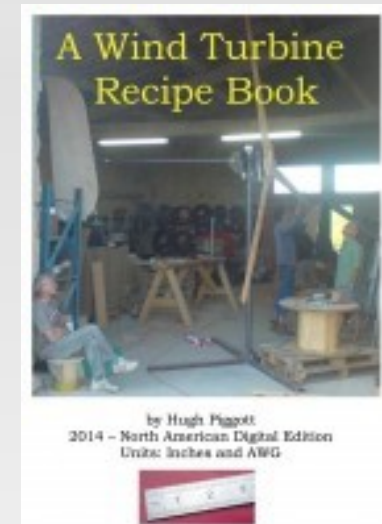


Photos from a wind turbine construction course

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3. Energy workshop: Open source hardware designs

- **Open source design** - Building the knowledge commons, copyleft, general public licenses, creative commons
- **Grassroots community innovation** - Peer-to-Peer collaboration, online design tools, forums, global networks
- **Knowledge transfer** - Convivial educational processes, hands on practical training, experiential learning
- **Local manufacturing** - low cost, easier to maintain, adapted to local conditions, local economic activity,
- **Cooperative production** - solidarity economy
- **Appropriate technology** - low cost, easy to maintain



“A Wind Turbine Recipe book: The Axial Flux Windmill Plans” by Hugh Piggott



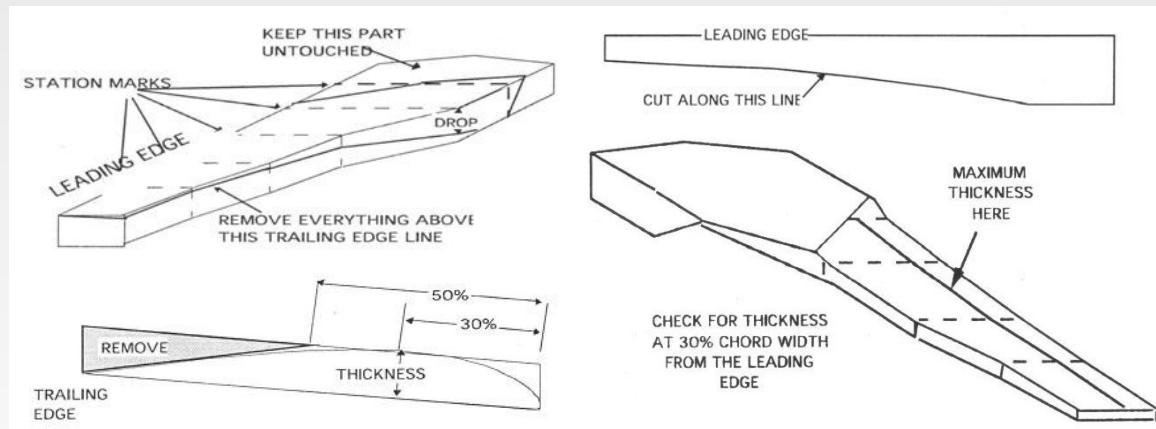
www.WindEmpowerment.org

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3. Energy workshop: Small wind turbine construction courses

Description of the construction process - rotor blades

- **Materials** - softwood from conifer trees
- **Tools** - chisel, draw knife, files, plane, spoke shave, hand saw, calipers, square
- **Techniques** - hand carving and measurements



"A Wind Turbine Recipe book: The Axial Flux Windmill Plans" by Hugh Piggott



Curving the airfoil - photo Nea Guinea collective Greece

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3. Energy workshop: Small wind turbine construction courses

Description of the construction process - axial flux PM generator

- **Materials** - neodymium magnets, enameled copper wire, steel, trailer hub, polyester resins, plywood
- **Tools** - jigsaw, drill press, electric arc welder, angle grinder, hand drill, hand made coil winder
- **Techniques** - plywood moulds, welding



The PM rotor, the stator cast in resin, assembly and the finished generator - photos ESCANDA Spain

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3. Energy workshop: Small wind turbine construction courses

Description of the construction process - guyed tilt up tower

- **Materials** - steel pipes, steel wire rope, turnbuckles, steel anchors, cement
- **Tools** - rope hoist, gin pole
- **Techniques** - welding, tower tilt up



Tilt-up using a gin pole - photo Comet-me Palestaine



Locally constructed SWT installed - photo Wind Aid Peru

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3. Energy workshop: Small wind turbine construction courses

Description of the educational process

- **Practical** - discovering the use of different tools, materials and techniques
- **Theoretical** - understanding basic physical concepts
- **Experimental** - testing the turbine generator to measure operation
- **Experiential** - observing the wind turbine after installation to understand its benefits and shortcomings



Practical



Theoretical



Experimental



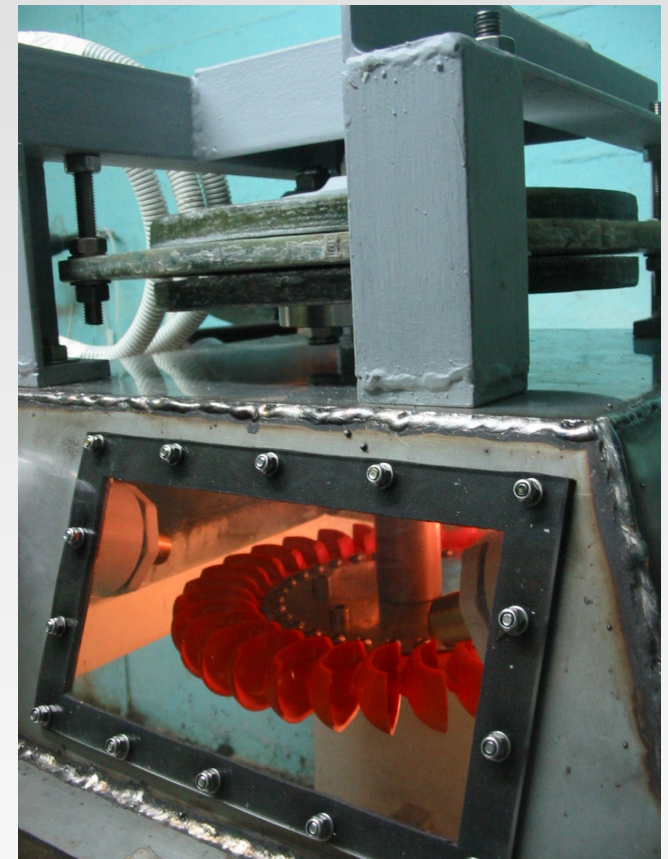
Experiential

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3. Energy workshop: OSHW research and development

Small hydro electric plant for rural farm - Mount Iti

- **Global network** - Communication with installers of locally manufactured small hydro in Wales and US, fieldlines.com forum on wind and hydro
- **Adaptation** - reconfiguration of wind turbine generator to be used in hydro application
- **Local manufacturing** - prototype constructed in the workshop of Nea Guinea in Athens with the assistance of volunteers
- **Operation and maintenance** - the prototype has been in operation 24/7 for 1.5 years without any requirements for maintenance



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3. Energy workshop: OSHW research and development

Small hydro electric plant system description

- 450W hydroelectric
- Charge controller and dump load with water heating element
- Battery bank 24VDC 120Ah
- Inverter 1200W 230V/50Hz
- Appliances: fridge, small kitchen appliances, mobile phone chargers, TV, internal and external lighting, power tools



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3. Energy workshop: Installations in urban permaculture projects

Locally manufactured solar panels on the roof top Cafe of Nea Guinea

- 450W (10 panels of 45W)
- Charge controller 40A
- Battery bank 12VDC 350Ah
- Inverter 550W 230V/50Hz
- Appliances: small fridge, small kitchen appliances, laptop, mobile phone charges, internal and external lighting , projector
- Solar panels manufactured by course participants



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3. Energy workshop: Installations in peri-urban permaculture projects

Locally manufactured small wind turbines in the eco-community of Spithari - Marathonas

- 600W SWT (2.4m diameter) for battery connection
- 900W SWT (3m diameter) for battery connection
- Charge controller and dump load, Battery bank 24VDC
- Inverter 1000W 230V/50Hz
- Appliances: laptops, pump, mobile phone charges, internal and external lighting, power tools.



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3. Energy workshop: Installations in rural permaculture projects

Locally manufactured small wind turbine and commercial solar panels in an organic olive tree farm - Filiatra

- 4500W (18 panels of 250W)
- 800W SWT (2.4m diameter) for grid connection
- Dump load
- Battery bank 48VDC 567Ah
- Αντιστροφέας 230V/50Hz
- Appliances: fridge, small kitchen appliances, coffee machine, washing machine, electric water heater, laptops, chargers, internal and external lighting, power tools



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3. Energy workshop: Installations in rural permaculture projects

Solar pump in an organic farm - Leykada

- 750W (3 panels of 250W)
- Submersible helical rotor pump
- Pump controller
- 16m³ of water per day in June/July/August
- Flow 1.9m³/h

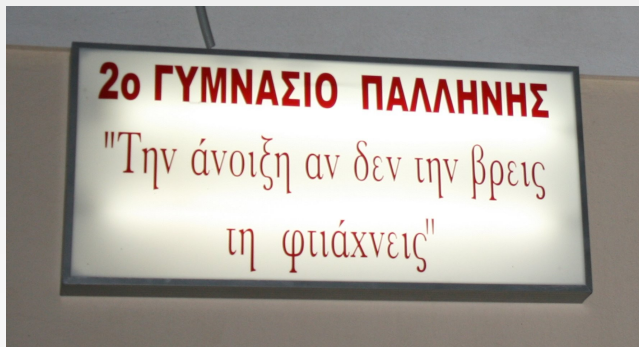


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3. Energy workshop: Environmental education in schools

Solar panel construction in a secondary school - Athens

- 45W solar panel
- 15 students
- Two 4 hour evening sessions
- The solar panel was installed in order to power a sing designed by the students



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3. Energy workshop: Environmental education in schools

Small wind turbine construction course in a high school - Kalymnos

- 250W small wind turbine
- 12 students
- 4 days of 7 hour workshops



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3. Energy workshop: Environmental education in festivals

DIY small wind turbine demonstration in eco-festivals - Greece

- 250W small wind turbine
- 40 participants
- 2000 visitors
- 3 festivals per year



'Peliti' local varieties seed exchange festival - Paranesti 2013

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4. Social networks: The social network created by the Energy workshop

Course participants

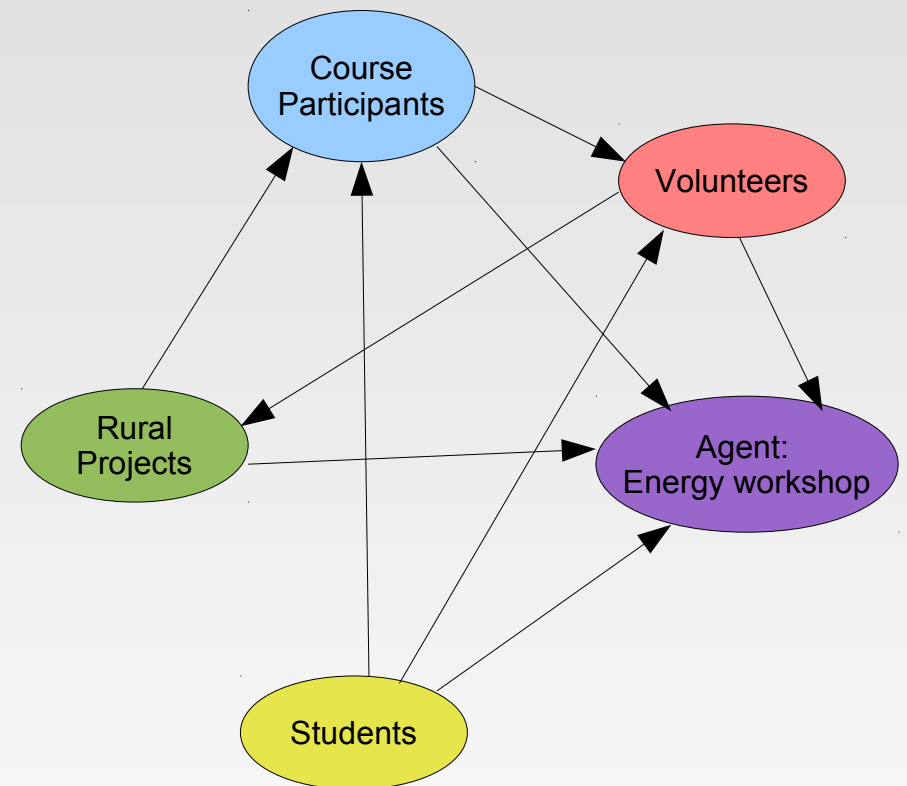
- Gender: 10% female, 90% male
- Age: 20 - 60 years
- Interest: learning experience 80% participation in social projects 10% back-to-the-land perspective 10%

Rural permaculture projects

- Gender: 30% female, 70% male
- Age: 30 - 50 years
- Interest: project needs electrification

Educational institutions

- Gender: 50% female, 50% male
- Age: 14 - 24 years
- Interest: environmental education



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4. Social networks: Challenges and solutions

- **Language barriers** - Wind turbine design manual in English → Greek translation by Nea Guinea
- **Financial barriers for course participants** - if they could not finance their tuition fees, although these were reduced to the minimum → possibility of exchanging with voluntary work in Nea Guinea
- **Financial barriers for rural projects** - if they could not raise a contribution to Nea Guinea for performing the installation → contribution was made optional depending on the financial abilities of the project
- **Financial barriers for rural projects** - if they could not finance the acquisition of materials for the installation → Nea Guinea provided solidarity loans which were paid back later
- **Geographical barriers** - most of the participants live in urban areas yet these technologies are most frequently applied in rural areas → still trying to build a transition movement!

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5. Conclusion: 'Nea Guinea' as an agent for a degrowth transition

- **Environmental awareness** - possibilities and limitations of small scale renewable energy
- **Empowerment** - individual and collective sense of achievement
- **Networking** - new social groups, new social interconnections, increase plurality
- **Social relations** - cooperation, solidarity, collectivism
- **Local economy and commons** - practical support of new degrowth projects
- **Decolonisation of the imaginary** - building utopia



Photos from collective actions of the Nea Guinea workshops

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Thank you for your attention!



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