Frameworks for Capacity Building in Renewable Energy Technology Delivery & Acculturation

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Frontiers of Science 2012, Australian Academy of Science, Menzies Hotel, Sydney 2-4 December 2012

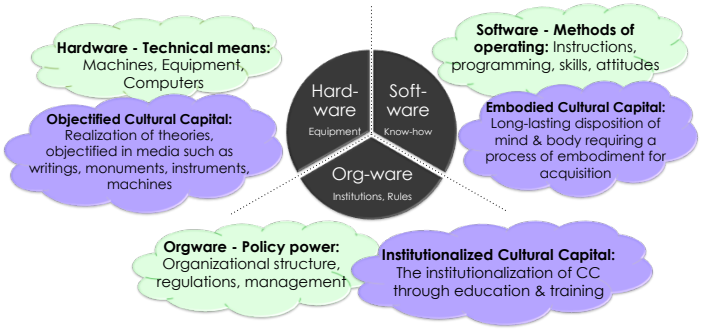
Introduction

Capacity building in Renewable Energy Technology (RET) delivery and acculturation is necessary to facilitate a transition to a green economy ("one which is low carbon, resource efficient and socially inclusive", www.unep.org). Design of a capacity building scheme should be based on a holistic view of technology as **hardware** (equipment), **software** (information, skill, knowledge) and **orgware** (institution, governance). Technology should be viewed as objectified, embodied and institutionalized cultural capital to facilitate its acculturation.

The I3A Framework in 21 Steps

The I3A (3A, WEC 2000) framework refers to an **Implementation** of the hardware, software and orgware dimensions of RET that maintains energy service **Accessibility** (financing, skill, network, resources), **Availability** (reliability and security of supply) and **Acceptability** (social and ecological) for the host community during and beyond the initial installation project. The I3A framework can be used as a **diagnostic tool** to assess existing energy service delivery or as a **design tool** for proposed energy service delivery, and can be applied at local or national levels, and for single or multiple technologies. The objective of the I3A framework is to ensure that RET intervention leaves a target community with enhanced capacity and resources for beneficial social innovation.

Holistic View of Technology: **Hardware, Software & Orgware**
(Dobrov 1979)



Technology as Cultural Capital: **Objectified, Embodied & Institutionalized** (Bourdieu 1986)

The I3A Renewable Energy Sustainability Framework

Implementation of renewable energy technology hardware, software and orgware that maintains energy service Accessibility, Availability, Acceptability in the short and long run

Implementation Orgware & Enabling Factors	Accessibility Access to Financing & Resources	Availability Service Reliability & Resource Security	Acceptability Social & Ecological Improvement
1. Orgware: Stakeholders, objectives, interrelationships	4. Affordability – Profitability (A-P) levels	9. Primary resource availability	16. Utilization of local resources (institutions, economy, norms)
2. Enabling factors: Policy, strategy, administration, coordination, governance	5. Financial intervention to bridge the A-P gap	10. Technical quality: Standards, safety, warranty	17. RET attributes vs User needs
3. External factors: Other programs, socioeconomic, political, global situations	6. Access to energy financing, market, network	11. Energy system integration	18. Socioeconomic outcomes
	7. Access to energy education	12. Domestic manufacturing	19. Suitability to environment
	8. Access to energy resources	13. After-sales infrastructure	20. Energy waste handling
		14. Local capable agent	21. Contribution to climate change mitigation effort
		15. User education	

The KPDAC Model & RET Acculturation Framework

Prior Condition	1 Knowledge	2 Persuasion	3 Decision	4 Adoption	5 Confirmation
Unaware of RET existence	Aware of RET existence	Favour / Unfavour RET	Decide to adopt or reject RET	Adopt RET, may Reinvent	Confirm RET adoption
Stakeholders & Roles in facilitating RET Acculturation ~ Research to Market Continuum					
Target Communities	**Research Bodies, Universities**	**Government, Donors, NGOs**	**Industry, Utility, Cooperatives**	**New Adopters/ Users**	**Confirmed Adopters**
Energy Needs/ Problems	RET Research (Basic/Applied)	RET Demonstrations	RET Commercialisation	Assess Initial Outcomes	Assess Long-term Outcomes
Prior experience, expectations for energy services	*Research, education, hardware, software, orgware expertise*	*Policy, funding, program, management expertise*	*Business, hardware, software, orgware expertise*	*Initial outcomes from RET adoption: Actual experience*	*Long-term outcomes from RET adoption: Actual experience*

Successful acculturation requires the sharing of stakeholder experience and knowledge to build capacity to design and implement an effective strategy

- **RET Acculturation:** The extent to which RET diffuses into & is assimilated by a community (Retnanestri 2007)
- **RET KPDAC innovation-decision process:** Potential adopters progress from gaining ***Knowledge*** of RET, to *forming an attitude* toward RET (***Persuasion*** stage), to a ***Decision*** to adopt or reject RET and, if to ***Adopt***, to ***Confirm*** or repudiate the adoption decision (adapted from Rogers 2003 in Retnanestri 2007)
- RET is acculturated if Users can **continue to confirm** RET service benefits. Hardware, software and orgware must **continue to function** for RET to become community cultural capital.