



THE AUSTRALIAN NATIONAL UNIVERSITY



FACULTY OF ENGINEERING AND INFORMATION TECHNOLOGY
DEPARTMENT OF ENGINEERING
CENTRE FOR SUSTAINABLE ENERGY SYSTEMS

TELEPHONE: +61 2 6125 5905
FACSIMILE: +61 2 6125 8873
EMAIL: Andrew.Blakers@anu.edu.au

Solarization

Mass retrofitting of buildings is the only way in which rapid reductions in greenhouse gas emissions can be achieved in the building sector. This is because the turnover of building stock (demolition followed by new construction) is low. Even if all new buildings have excellent energy ratings, there is only a slow reduction in average greenhouse intensity.

Mass retrofitting of roof, wall & floor insulation, draught proofing and solar water heaters to existing buildings (“solarization”) will yield large greenhouse gas reductions. In a typical brick veneer house the cost of thorough solarization is \$7,000-\$10,000. The reduction in energy bills pays for solarization well within the lifetime of the improvements. The barriers to mass solarization are the need for up-front capital and the lack of information on the part of building owners. This paper suggests a practical and commercially attractive method of removing these obstacles.

Australians move houses frequently. An investment in solarization is often not recognised in the sale price of the house. There is no incentive for a landlord to invest in solarization because they do not pay the energy bills. There is no incentive for a tenant to invest in solarization because they do not own the house. How to pay for solarization, up front?

A mechanism for solarization is proposed. Consortia would be established (e.g. “Solarization Pty Ltd”) comprising a solar water heater company, a house insulation installer, a billing agency and a financier. Solarization P/L would contract its members to retrofit solar water heaters, insulation and weather proofing in houses and commercial buildings. The company could also install double-glazing, curtains, pelmets, gas heaters and photovoltaic systems.

Ad-hoc delivery of energy services, whereby the homeowner has to deal with three or four separate companies to fully solarise, is unlikely to result in widespread take-up. In contrast, successful solarization will be a service that is provided by companies offering smooth, no-fuss, comprehensive service – eg, one phone call, a single visit by an assessor skilled in all of the energy technologies, easy financing, one contract, rapid & trouble-free installation of insulation & equipment and good after-sales service.

Methods of recovering the solarisation investment include:

- Up-front payment by the building owner. For example, the funds could be redrawn from the house mortgage.
- Increase the standing charges on quarterly gas or electricity bills to allow Solarization P/L to recover its investment (at normal commercial rates of return) over 8-12 years.
- Regular quarterly repayments through a billing agency

House owners (and tenants) would enjoy reduced overall energy costs (comprising gas, electricity and the solarization quarterly repayments) and improved thermal comfort and noise insulation.

Solarization P/L would construct alliances with insulation and solar suppliers that includes the supply of equipment & services at a substantial discount to reflect reduced advertising costs and increased sales volume. Companies involved in solarization will benefit from a low risk investment, because the equipment to be installed has a long guarantee period and the risk of default by the building owner is low.

Initial solarizations could focus on the items with the most clear-cut financial benefit. This would increase the probability that the scheme is commercially successful. In approximate order this would be ceiling insulation, weather proofing, house zoning and low-flow shower heads followed by solar water heaters and wall & floor insulation followed by photovoltaic systems and double glazing.

Solarization will create a substantial number of new jobs in the local community. The scheme fits very well with the building energy rating scheme in several states. Early solarization companies will be well placed to dominate the national solarization market that is likely to develop in a few years time. The risk is low because the debt is secured against the building and is repayable within the guarantee period of the equipment. Large reductions in greenhouse gas emissions are likely.

Solarization can be tested on a small scale in a few suburbs or in a regional centre. Early adopters could be the 2-3% of customers who purchase “greenpower”. Housing trusts for low-income tenants and upper-income, busy professionals are two other groups of potential early adopters.

A large majority of local government districts in Australia have no gas, coal or electricity production. In these districts there are few economic losers from tough greenhouse targets. On the contrary, there are many winners. Solarization reduces the export of money from a town to pay for imported gas and electricity. Solarization is more labour intensive than electricity or gas production, and most of the jobs are local.

Tenants living in uninsulated homes will be big winners, since it gets around the problem that the landlord has no incentive to invest in energy efficiency because the landlord does not pay the energy bills. Solarization is one of the rare occasions when employment, social, economic and environmental objectives are aligned, and is therefore politically attractive, particularly at a local level.

Gas and electricity companies will experience reduced sales of energy. However, solarization will provide replacement revenue and profit. They will have the opportunity to “lock-in” customers for long periods (an important consideration in the era of contestability) and will acquire a large supply of RECs from the solar water heaters. Solarization of 100,000 homes in Canberra over a decade would be worth around \$100 million/year and would lead to the creation of about 700 new jobs. Electricity utilities will benefit from mass solarization through a reduction in peak loads, because better insulation will reduce the space heating peak-load in winter and the air conditioning peak-load in summer while solar water heaters will have gas or off-peak electric boosting. Solarization also helps energy companies (eg in NSW) cope with any government requirements that the greenhouse intensity of their products must decline each year.

Government moral support would be valuable, in order to give credibility to this new idea. A modest initial Government subsidy could also accelerate uptake. In return for a modest subsidy Solarization P/L would promise to solarize a specified number of buildings to a specified standard (eg 4 stars). The Government might also include a tender provision that rewards local manufacturing. Alternatively, Councils could offer modest revenue-neutral rate relief that is linked to the star rating of a building.