

# Do you have the facts to make sustainability a reality?



**If you want to understand how systems and technologies can help balance environmental and economic demands, consider talking to the Institute for Sustainable Systems and Technologies (ISST).**

Sustainability is both a national research priority and a “hot topic”. It’s an emotive issue, but at its heart is scientific knowledge.

For more than a decade, the University of South Australia (UniSA) has been providing hard facts on environmental issues and options to governments, industry and community groups, significantly influencing the development of products, programs and policies.

The Institute for Sustainable Systems and Technologies (ISST) combines expertise in natural and built environments, energy, water, transport, land-use and agriculture. This skills mix allows it to offer integrated solutions to complex problems, whether through systems analysis, mathematical modelling, decision-making support, product development or simply lateral thinking.

### Finding the right balance.

Sustainability is as much about growth as it is about preserving what we have. As the World Commission on Environment and Development<sup>1</sup> has noted, “Humanity has the ability to make development sustainable – to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs.”

ISST’s brief is to develop systems and technologies that will sustain ecosystems and facilitate social and economic development while optimising the use of natural resources, minimising waste, emissions and other environmental consequences, and reducing costs.

Researchers collaborate with like-minded experts and industry bodies in around 20 countries. Key partners include: the World Renewable Energy Network; Stanford University’s Systems Optimisation Laboratory; ACME Telepower Ltd, India; Cranfield University in the UK; and Technion, Israel.

INTERNATIONAL COLLABORATIONS



### Meeting society’s needs and yours.

ISST’s interests are diverse, ranging from water recycling systems and energy efficient housing to new systems for sustainable manufacturing. We run the National Laboratory for Transport Network Analysis, have mapped the “ecological footprint” of South Australia regions, and helped Orlando Wyndham add value to its business with a new grape sampling device.

A common response from clients is that “UniSA will definitely be among the first people that we’ll call to help us in the future.”<sup>2</sup>

ISST provides short-term consultancies, contract research, industry-based education programs and testing services for projects and can match research needs with funding opportunities. As UniSA is a recognised research agency, clients can structure research programs to gain taxation benefits.

**“UniSA and ISST has been a key player in providing research and practical advice for initiatives involving water recycling and energy efficient housing... We have found their work to be timely, efficient and of high quality.”**

Kelvin Trimper, General Manager Sustainability Initiatives, Lend Lease Communities

## Expanded star rating system for houses will make efficiency a virtue.

UniSA has pioneered major changes in how Australia measures, regulates and encourages energy efficiency in houses.

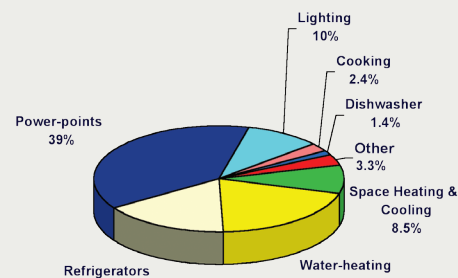
A decade ago our scientists developed a methodology for checking building design before construction which led to the creation of the points-based “star rating” system that became mandatory for all new buildings. Now more recent work within ISST will underpin two significant advances.

We are collaborating with CSIRO and the New Zealand Building Research Centre to upgrade the system to incorporate all major energy consuming devices. This means that in the near future star ratings will be based on how much energy it takes to actually run an individual house.

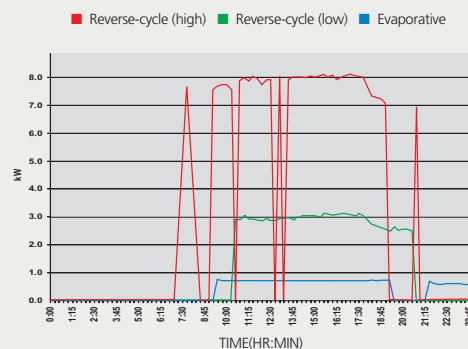
They will also be more public. A new 10-star system will rate houses up to virtual self sufficiency, thus acknowledging efforts to build in energy efficiency above minimum standards. The intention is that all houses offered for sale or rent in Australia will have to publicise their star rating.

ISST has worked extensively with energy suppliers and property developers to evaluate energy profiles and model greenhouse gas emitting appliances in the domestic sector. As a result solar and gas hot water systems have been mandated in new houses in many states. The ultimate aim is to create housing developments that build in efficiency and appropriate choices.

**FIGURE 1:** Primary energy consumption in homes. Breakdown of primary energy use of household appliances, which are large contributors to greenhouse gas emissions.<sup>3</sup>



**FIGURE 2:** Demand profiles for 3 Adelaide homes using different air conditioners on a peak summer day. Peak energy demand on hot afternoons is primarily due to domestic air conditioning use, and for some homes can be up to 8 times the average demand. The use of energy efficiency features in the house and selection of energy efficient air conditioning systems can reduce the cooling demand considerably.



<sup>1</sup> World Commission on Environment and Development, Brundtland Commission, “Our Common Future”  
<sup>2</sup> Russell Johnstone, Group Technical Manager, Viticulture and Winemaking, Orlando Wyndham  
<sup>3</sup> Research based on detailed monitoring of a cluster of homes over a 2 year period (April 2002)

**Make the decision today to incorporate ISST into your development strategy.**