



# Supporting increased residential energy efficiency throughout Australia

CSIRO has more than 60 years of experience in energy efficiency research, modelling and dissemination of information that has made us a leader in energy.

Australia has been aggressively pursuing improved residential energy efficiency over the last 20 years, implementing the Nationwide House Energy Rating Scheme (NatHERS) in 2003 and increasing thermal performance requirements for new homes since then. The Building Code of Australia was updated in 2010 (BCA 2010) to include a 6-star rating for residential building thermal performance, and the National Construction Code was updated in 2022 (NCC 2022), to include a 7-star rating for residential building thermal performance.

## The challenge

As rising house prices have become a major concern in Australia, the building industry needs to prepare for a rapid expansion in construction. At the same time, energy use is an important focus throughout Australia, with the government setting the National Energy Productivity Target to improve Australia's energy productivity by 40 per cent between 2015 and 2030 (COAG Energy Council, 2015). To meet both the need for more housing and reduced energy use, there is an increased emphasis on residential energy efficiency.

Energy efficiency standards play a key role in reducing energy consumption from the residential sector. However, builders have a greater incentive to save money on upfront building costs as the

economic benefits from a reduction in energy use are realised by residents over the long term.

## The response

It is important to have a neutral arbiter of information who can conduct research, build modelling tools and disseminate information to stakeholders to facilitate the development of standards and regulations. In Australia's residential building sector, CSIRO plays this role for residential energy efficiency.

The most prominent output of CSIRO's residential energy efficiency research and modelling work has been the AccuRate tool. The AccuRate tool is built using the Chenath simulation engine. The Chenath engine is the culmination of decades of development of different methodologies, rules and algorithms that were the foundation of preceding models that CSIRO developed. CSIRO has also played a key role in the development and deployment of NatHERS, the residential home building rating system.

## The impact

In 2004, NatHERS was adopted as the nationwide approach for rating building energy efficiency. It is currently used to assess about 90 per cent of new home designs (Department of Climate Change, Energy, the Environment and

Water, 2022), creating a thorough inventory of newer Australian housing stock and allowing the energy efficiency regulations in the BCA and NCC to be implemented. AccuRate is still used as the benchmarking tool for NatHERS, providing the industry with confidence in the data and methodology underlying the energy efficiency rating system and requirements for new Australian homes.

CSIRO's work has supported:

- an acceleration of the implementation of BCA 2010 and NCC 2022 due to CSIRO's research support and analysis tools like AccuRate
- an agreement on information, analysis methods and modelling techniques across an array of industry stakeholders, providing confidence in the regulatory analysis of new policy
- greater access to information on home energy performance on new and existing housing stock with the support of NatHERS and the future release of RapidRate.

An independent impact assessment showed that from 2003 through 2050, CSIRO's energy efficiency services provide a median present value estimate of \$1.72 billion in net benefits (within a range of \$609 million to \$3.17 billion). A median benefit-cost ratio of 69 is estimated, with a range of 24 to 127. This means that for every \$1 invested, around \$69 in benefits accrue.