



by mark lochran

The economics of sustainable development

Government regulation and greater public focus on sustainability issues are increasing pressure on industry to find efficiencies in delivering green outcomes. Ecologically sustainable development touches on all aspects of the planning, design and construction process and requires better understanding of the cost factors.

Recent political and media focus on climate change and the nation's water crisis has heightened public concern regarding the environment and sustainability. Within the residential property sector the issue is not about industry opposition to the principles of Ecologically Sustainable Development (ESD), but rather a debate about its costs and whether the market is ready to accept these.

Additional hurdles, in advancing ESD concepts, arise from a maze of government regulation and legislation on sustainability and environmental issues. This includes the confusing array of rating tools with inconsistent measures for building performance, variations in Building Code of Australia (BCA) standards across States, and differences in local planning requirements

So, what does ESD mean in terms of cost and does it stack up? The fundamental principles for sustainable development are:

- Efficiency in energy consumption
- Indoor environment quality
- Water conservation
- A focus on renewable resources and recycling
- Consideration for the relationship between building and the environment

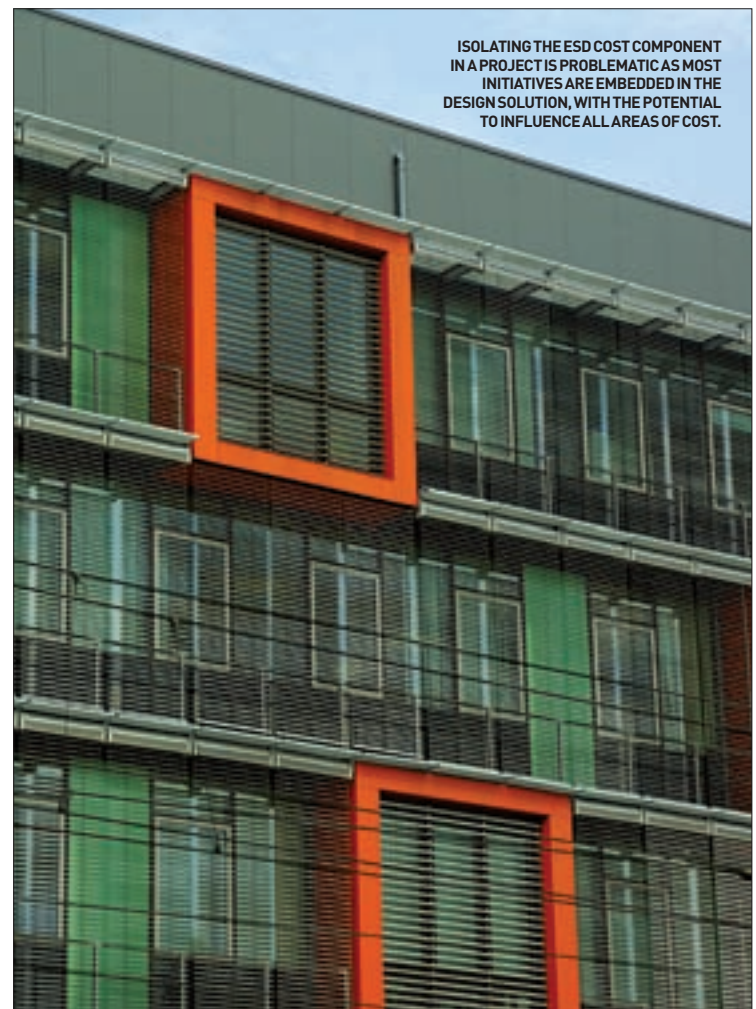
- Solar hot water system
- Light shelves for natural lighting
- Insulated services installations
- Insulated walls and ceiling
- On-site electricity and heat generation
- Water conservation and rainwater collection
- Performance glass
- Roof overhang, window eaves, pergolas, louvres and external blinds
- Energy-efficient appliances
- Passive solar orientation

Minimum standards and planning requirements, along with the range of available ratings tools, aim to achieve ESD through regulation with an emphasis on energy efficiency, water conservation and thermal properties.

Sustainable-development initiatives for residential projects may include:

DOES ESD RESULT IN HIGHER PROPERTY PRICES?

Additional costs for incorporating sustainable features are said to be a major road block to ESD implementation. Some say additional costs for sustainability initiatives place upward pressure on



ISOLATING THE ESD COST COMPONENT IN A PROJECT IS PROBLEMATIC AS MOST INITIATIVES ARE EMBEDDED IN THE DESIGN SOLUTION, WITH THE POTENTIAL TO INFLUENCE ALL AREAS OF COST.



HOW LONG IS A PIECE OF STRING?

How much is ESD? This depends on countless design variables.

There are a range of opinions from zero cost to in excess of 10 per cent of construction cost. We can shed some light on the cost aspects of ESD by examining a recent residential project and analysing the cost of design concepts that were adopted to achieve the best possible ESD outcomes for the particular site and building.

Our case study relates to a three-level, high-quality, city-fringe, residential project containing 41 residential units, with a total gross floor area (GFA) of 2900 m², at a total construction cost of \$8,100,000 (Total project cost includes design, contingency, cost escalation during construction, contract contingency, professional fees and ESD initiatives) incorporating the following initiatives.

For this particular project, the best achievable ESD outcome added almost 7.5 per cent premium to the construction cost, or an additional \$13,950 per apartment.

A detailed analysis reveals of the 34 identified initiatives, half had no cost attributed to them.

Cost-free initiatives included:

- Housing unit designed to have good access to daylight and outside air
- Windows designed to promote natural ventilation
- Energy-efficient appliances
- Avoiding materials that emit volatile organic compounds (VOCs) (substances made up of predominantly carbon and hydrogen)
- The use of recycled materials in construction
- Tenants encouraged to purchase water-efficient washing machines by setting up favourable purchasing arrangements.

IS ESD A PROBLEM OR OPPORTUNITY?

In the US, the green building market is said to be growing at 30 per cent a year. If US trends are any indication of where Australia is headed, we can be sure that ESD is not merely a passing fad.

A recent survey by Trilogy Communications of Sydney and Melbourne residents and their attitudes towards development and

planning indicates there is a high level of concern regarding green issues.

Policy and regulation from all levels of government further reinforces the view that ESD is here, and it is here to stay.

Good ESD outcomes are in many cases simply a matter of good design. Rather than tacking a few extra green features almost as a footnote, an approach that integrates the principles of sustainability with the planning, design and construction planning process will avoid unnecessary costs and deliver high-value residential-property assets.

Developers who are innovative, with the capability to deliver products in the current changing environment, will be best placed to reap the full value potential from ESD. +



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THIRTY-FOUR ESD INITIATIVES WERE IDENTIFIED AND GROUPED INTO SEVEN CATEGORIES:

1	PASSIVE SOLAR DESIGN OPPORTUNITIES	\$202,000
2	ENERGY-EFFICIENT BUILDING SERVICES	\$172,000
3	OPPORTUNITIES TO MINIMISE POTABLE WATER USAGE	\$90,000
4	OPPORTUNITIES TO IMPROVE THE QUALITY OF STORMWATER	N/A *
5	OPPORTUNITIES TO MINIMISE THE ENVIRONMENTAL IMPACT OF BUILDING MATERIALS	\$85,000
6	OPPORTUNITIES TO MINIMISE WASTE GENERATED DURING ITS CONSTRUCTION AND DURING ONGOING OPERATIONS	\$22,000
7	SUSTAINABLE TRANSPORT INITIATIVES	\$1,000
	TOTAL COST OF ESD INITIATIVES	\$572,000

* Stormwater collection and reuse system was deemed unfeasible due to site restrictions.

Passive solar design opportunities

Where a building is designed to minimise the need for building services by including design features, which reduce the heating effects of the sun in summer and take advantage of the sun to heat the house in winter.

Energy-efficient building services

Examples are heating, air-conditioning and hot water systems that have high star ratings and minimise the amount of energy used.

Opportunities to minimise potable water usage

Plumbing fixtures that are designed to keep water use to a minimum and also incorporate water recycling of rainwater and grey water.

Opportunities to minimise environmental impact of building materials

The building will be built from timber from sustainable forests and minimise the use of materials that use a lot of energy during manufacture. Selection of materials that are recycled is done where possible.

Opportunities to minimise waste generated during construction and ongoing operations

The building is designed to suit standard material sizes to minimise waste. Rain and grey water is retained on site and reused to avoid discharging to the environment.

Sustainable Transport initiatives

The building will be located near public transport and have bike storage facilities to enable residents to reduce the need to use their cars.

Opportunities to improve the Quality of Stormwater Emissions

Stormwater collection and treatment systems.

house prices at a time when housing affordability is a serious issue. However, precisely how much ESD exacerbates this situation is difficult to establish.

In recent years, there has been unprecedented pressure on property prices through a complex interplay of many variables. While the main portion of the final property price is obviously construction and land costs, other new and increased cost factors such as government charges, levies, taxes, occupational health and safety and compliance are also having significant impacts.

There is no universal formula that specifies the set of characteristics to take a project over the "green" finish line. Every building project is unique, developed to meet different needs and environs.

Isolating the ESD cost component in a project is problematic as most initiatives are embedded in the design solution, with the potential to influence all areas of cost. Features such as energy-efficient light fixtures and solar hot water units will be one-off costs, however, others such as façade design and building orientation need not be considered as anything other than an efficient and innovative design evolution.