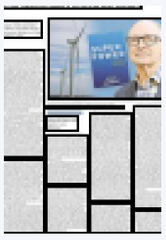
SECTION: GENERAL NEWS ARTICLE TYPE: NEWS ITEM AUDIENCE : 19,268 PAGE: 34
PRINTED SIZE: 936.00cm² REGION: ACT MARKET: Australia ASR: AUD 7,186 WORDS: 1426
ITEM ID: 1197590977



09 NOV, 2019
Our opportunity to feed the future
Canberra Times, Canberra

Our opportunity to feed the future

In this extract from his new book, ROSS GARNAUT outlines Australia's bright economic future in a 'post-carbon' world.

IN THE 2008 Garnaut Climate Change Review, I drew attention to the historic increase in world food prices in the first decade of the new century. And I highlighted that improving living standards in the populous countries of Asia would make this a great opportunity over a long period for Australian farmers and therefore all Australians - unless climate change at home damaged Australia's supply capacity. Global climate change mitigation was needed, or Australia's farm capacity would be reduced. The irrigation output in the Murray-Darling could decline by 90 per cent if the world failed to act. By 2019, new knowledge has reduced uncertainty without much changing these predicted consequences. We can now see the effects anticipated in 2008. Average temperatures across Australia so far this century are over a degree higher than in the first half of the 20th century. The average inflow to the Murray-Darling in the past seven years has been a quarter below the first century of observation.

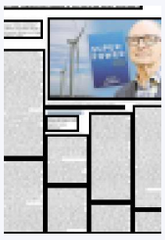
In Paris in December 2015, all members of the United Nations agreed to hold temperature increases below 2°C and as close as possible to 1.5°C. The best that we can hope for now is holding increases globally to around 1.75°C - if the world moves decisively towards zero net emissions by 2050. But temperatures over land will increase by more than the average over land and sea. An increase of 1.75°C for the whole world would mean more than 2°C for Australia - twice the increase that this year helped to bring bushfires in August to NSW and Queensland. Such temperature increases would present a massive adaptation task. A failure to act in Australia, accompanied by similar paralysis in other countries, would see our grandchildren living with temperature increases of around 4°C this century - and more beyond.

So is it all bad news? What we now know about the effect of increased concentrations of greenhouse gases in the atmosphere has broadly confirmed the conclusions I drew from the scientific research available for my 2008 and 2011 reviews. But on the other hand, these reviews greatly overestimated the cost of meeting ambitious reduction targets. If we are wise, we can change the political story of climate policy in this nation. I now believe that if Australia rises to the challenge of climate change it will emerge as a global superpower in energy, low-carbon industry and absorption of carbon in the landscape. The good news is very good indeed for Australia, and especially for rural and provincial Australia.

Energy will be produced mainly outside the large cities, much of it in remote locations. This will make it commercially attractive to process many mineral and agricultural goods into products of higher value close to the sources of the basic commodities. A new carbon-farming industry, prospering exceptionally in less agriculturally productive regions, will add substantially to rural incomes. Biomass will have additional value as a base for new industry, especially when combined with low-cost energy. New farm- and station-based activities on average will make fewer demands on water than the old. And low-cost energy will improve the economics of recycling, desalinating and transporting limited water resources. Rural and provincial Australia will be the engine room of the superpower of the low-carbon world economy. Food production will be a key part of that.

The 21st century has seen strong economic growth in developing countries, even as incomes have stagnated in the developed world since the GFC. Rising incomes in developing countries have seen rapid movement towards the food consumption patterns of the rich. Chinese meat consumption rose more than tenfold over 40 years of reform and development, to almost 70 kilograms per capita per annum, or about

SECTION: GENERAL NEWS ARTICLE TYPE: NEWS ITEM AUDIENCE : 19,268 PAGE: 34
PRINTED SIZE: 936.00cm² REGION: ACT MARKET: Australia ASR: AUD 7,186 WORDS: 1426
ITEM ID: 1197590977



09 NOV, 2019

Our opportunity to feed the future

Canberra Times, Canberra

the average of the developed countries. Chinese consumption is dominated by non-ruminant meats - pork and chicken - which are more efficient in converting grain into animal protein and do not emit methane from enteric fermentation, but nevertheless place pressure on land and the natural environment. Chinese direct and indirect demand for grain has pushed up global prices. South Asia, with its religious and cultural constraints on eating meat (particularly beef), will not see similar levels of meat consumption to China. But the pressures on land resources from increasing expenditure on food will still be large. And development in Africa is likely to place similar pressures to those in China on food production and the natural environment.

The convergence of economic development, climate, biodiversity and general ecological and health imperatives will transform global diets. Rising prices of meat in general and especially ruminant meat will modify consumption patterns. We think of our food consumption patterns as changing little over time. In fact, the experience is that Australian food consumption has changed radically in response to exposure to alternatives through culturally diverse immigration, and to such mundane influences as relative prices. Australians led the world in consumption of sheep and cattle meat when I was young. Since 1960, Australian consumption per person of meat from cattle has fallen by almost 20 per cent, and from sheep by almost 90 per cent, despite very large increases in average incomes. Over the same period, pork consumption has increased by over 375 per cent and poultry by over 1300 per cent. Consumption changed inversely to relative prices: between 1960 and 2018, poultry real prices fell by 75 per cent, and pork rose only a little (having fallen well below 1960 levels through the 1980s,1990s and 2000s), while beef prices rose by over a third and mutton and lamb by over two-thirds. Even in a conservative country like Australia, food consumption patterns can change radically over relatively short periods of time. And it seems that changes in relative prices are an important force for change.

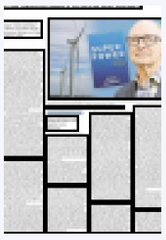
Changing personal preferences will play an important role in the future of food. The health story will become more influential everywhere - following trends among better-educated and higher-income people in the developed countries. Larger numbers of people in high-income nations will be influenced by the climate, ecological and animal welfare cases for greater reliance on plant-based foods. All of this will open the way to a revolution in production of meat-like manufactured foods. Products from processes using animal stem cells to grow chemically indistinguishable meat substitutes from biomass will also become indistinguishable in taste, texture and nutrition to meat from the killed animal - and superior in nutrition, if that is preferred.

Vegetable-based foods with the taste and texture of meat will become closer to the real product for those who prefer it to unaltered natural vegetarian fare. The price of meat from both stem cells and plants will fall, eventually to below the rising price of farm meats. The first cell-based hamburger a few years ago cost $US300,000 to produce. In 2019, it could be produced for about $US10. Large-scale production will bring costs down further. More generally, there will be a shift in demand to higher-quality, safer and more expensive food. Australia has comparative advantage in supply of the higher-value products that will dominate demand - especially in supplying the world's largest and most rapidly growing markets in Asia. The main meat substitutes make intensive use of biomass and energy and use less water than the animal competitors.

The new foods will include growing proportions from hydroponic technologies using renewable energy. The Sundrop greenhouse in Port Augusta, producing tomatoes to supply Coles retail outlets all over the country from desalinated water using solar energy in an arid region, is an exemplar of a new order. Capital and expertise will be more important and water less so in food production.

A decade ago, Australia was deeply invested in the old energy economy, with the highest carbon emissions per person in the developed world. Adjustment to the low-carbon economy of the future was necessary, but expensive. In 2019, Australia is more deeply invested than ever in the old

SECTION: GENERAL NEWS ARTICLE TYPE: NEWS ITEM AUDIENCE : 19,268 PAGE: 34
PRINTED SIZE: 936.00cm² REGION: ACT MARKET: Australia ASR: AUD 7,186 WORDS: 1426
ITEM ID: 1197590977



09 NOV, 2019

Our opportunity to feed the future

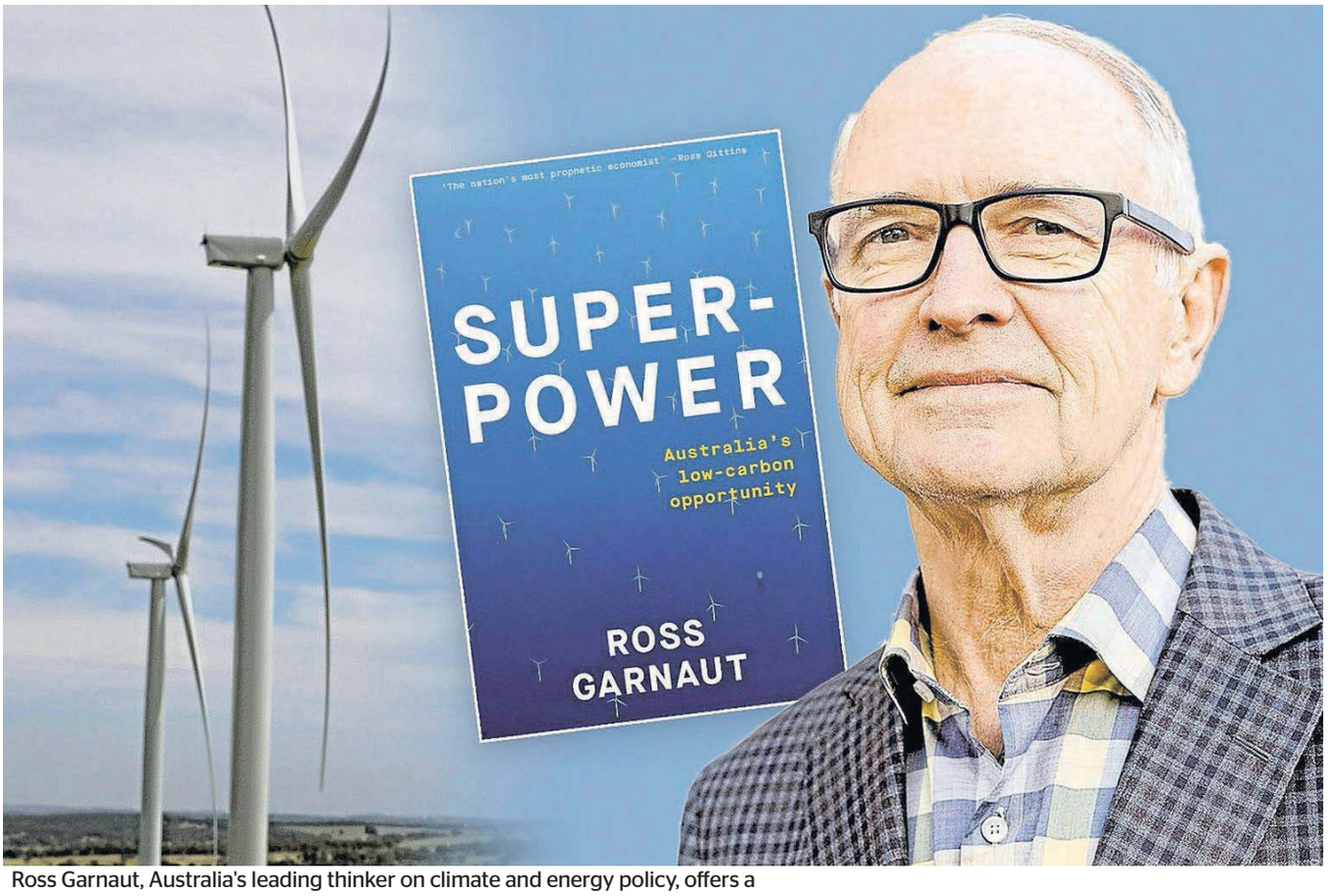
Canberra Times, Canberra

energy economy. But now the immediate costs of making the change are much lower, and it is clearer that Australia can prosper exceptionally in the post-carbon world.

Ross Garnaut is Professorial Research Fellow in Economics at the University of Melbourne. "Superpower: Australia's low-carbon opportunity" is published by La Trobe University Press ($29.99).

Rural and provincial Australia will be the engine room.

Ross Garnaut



Ross Garnaut, Australia's leading thinker on climate and energy policy, offers a road map for progress in his new book, "Superpower: Australia's low-carbon opportunity".