

## MEDIA RELEASE

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### SALT INTO STEEL

Ironmaking is offering a new way for Australia to tackle three of its greatest environmental challenges – salinity, renewable energy and greenhouse emissions.

In an imaginative solution that combines environmental protection with heavy industry, researchers from **two Cooperative Research Centres (CRCs)** are investigating the use of charcoal from oil mallee trees for making iron and steel.

The trees will be grown in belts in agricultural areas to control dryland salinity by lowering groundwater tables, and reducing greenhouse gases by absorbing CO<sub>2</sub>. They will also produce valuable oils, timber, charcoal and activated carbon, under a project developed by partners in the **CRC for Plant-Based Management of Dryland Salinity (CRC Salinity)** .

The use of charcoal from the mallee timber as a reductant for making iron and steel is being tested by the **CRC for Sustainable Resource Processing (CSRP)**.

The CSRP chief executive Mr Stevan Green says that new research indicates mallee charcoal could be a viable replacement for coke (made from coal) in a bath iron-smelting process.

It has the advantages of being a renewable source of energy in which the next crop of trees absorbs much of the CO<sub>2</sub> that is emitted when the charcoal is burnt, reducing the greenhouse impact.

Studies by CSRP show that if 20 per cent of the coke used to make iron is replaced with charcoal, then non-renewable energy use falls by 13 per cent, as does the overall global warming potential.

If coke is totally replaced by charcoal, non-renewable energy consumption and greenhouse potential both drop by at least 60 per cent.

"We've found that using char produced from trees instead of coke to fuel iron ore sintering has the potential to significantly improve productivity and environmental performance," says Mr Green.

"It's interesting, when you think about it. For more than 3000 years the world relied on wood char as fuel for smelting, resulting in widespread deforestation. Coal only came in as blast furnace fuel during the 18 th century.

"It's interesting that, three centuries on, we are again looking at charcoal – this time for environmental reasons," he says.

One drawback is that charcoal is not quite so efficient at reducing iron as coke, but recent work by CSIRO into the physics of the reaction gives promise that this obstacle can be overcome through fine-tuning the conditions under which fuel is injected into the slag bath.

The use of mallee charcoal for ironmaking emerged from a decade of research into the commercial development of mallee as a farm tree crop.

"Mallees are naturally prodigious water users with deep roots, and there's every reason to think they will be effective in lowering water tables and helping to control dryland salinity," says John Bartle, of the WA Department of Conservation and Land Management (CALM).

"One of the challenges in making woody crops like mallee relevant to salinity control is to have markets of sufficient size and profitability. The industry is hopeful that the \$10 million, one fifth-scale pilot plant developed by Western Power at Narrogin for processing whole mallee feedstocks into eucalyptus oil, activated carbon and electricity will show that large markets for these products can be tapped."

If this trial proves successful full-scale plants will need 100,000 tonnes of feedstock from 10,000 ha of mallees planted in strategic strips across wheatbelt farms to support it, Mr Bartle says. There is potential to build 9-12 full scale processing plants in the WA wheatbelt, while more could be considered in salt-affected areas of the Eastern States.

"The development of mallee and other woody crops is limited by the comparatively small markets for activated carbon. The preliminary step in manufacture of activated carbon is charcoal. That's why we decided to look at ironmaking using charcoal.

"If the project proves a success, Australian iron will take on a new, green image, helping in the fight against salinity and greenhouse, and taking the nation another step on the road to renewable energy."

Mr Bartle said that the push to diversify woody crop types and products has now been taken up by the Florasearch Project run by CRC Salinity. It is screening native trees across southern Australia to determine their potential for producing wood, industrial products, bioenergy and fodder while helping to combat salinity and greenhouse.

**More information:**

Dr Stevan Green, CSRP, 08 6436 8734, 0419 583 461

John Bartle, CRC Salinity, 08 9334 0321 or 0408 907 762

Dr Bruce Munday, CRC Salinity, 08 8538 7075 or 0417 895 249

Prof. Julian Cribb, CRCA media, 0418 639 245