Submission No 40

INQUIRY INTO DEVELOPMENT OF A HYDROGEN INDUSTRY IN NEW SOUTH WALES

Organisation: South Coast Labour Council

Date Received: 5 March 2021

5 March 2021

The Chair
NSW LC Inquiry
Development of a Hydrogen Industry in NSW
Parliament of NSW

Dear Chair and Committee Members,

Re: South Coast Labour Council Submission – Hydrogen Inquiry

We enclose our submission to this inquiry on behalf of the South Coast Labour Council. We submit that the Illawarra region and Port Kembla specifically has a very strong claim as a site for Hydrogen production, storage and distribution for both domestic consumption and export.

1. Overview

The key points and recommendations pursuant to the ToRs are summarised as follows:

1.1 Port Kembla Steelworks, the heart of Australian making, will most likely be Australia's largest consumer of hydrogen as the decarbonisation of steelmaking eventually leads to the replacement of coal with hydrogen as the principal reductant in this process.

1.2 The growth and development of off-shore wind technology internationally along with extremely promising preliminary wind map data along the continental shelf off the Illawarra coast represents a golden opportunity for multi GW renewable energy generation required for hydrogen production using the electrolysis method.

1.3 The massive growth in renewable energy generation and low emission fuels such hydrogen projected to occur in Australia in the next 2 decades including the infrastructure for distribution will correspond with a significant increase in demand in steel production and fabrication capacity. These are unquestionably clear and proven strengths of Port Kembla that will be able to fulfill major segments production process from our mines to our steelworks and fabrication capacity for pipelines where required.

1.4 The industrial infrastructure of Port Kembla, with a deep water industrial harbour and available industrial land readily allows for the movement of material into the port and export of hydrogen product (in its composite transportable form) out as well.

1.5 The University of Wollongong and its research centres are well placed to support R&D requirements for the local development of the hydrogen industry and future developments in the decarbonisation of steel production. Existing centres include the Materials Research Centre and the Steel Research Hub.

1.6 There is a broad community and industry consensus in the Illawarra region in support of the development and local production of renewable technologies and particular interest in the production and development of hydrogen in the region.

1.7 The South Coast Labour Council are Co-Conveners of *Recharge Illawarra* a multi stakeholder group bringing together industry, union and Community leaders to advance this agenda would like to extend an invitation to the Committee to visit the region as part of your fact finding activities and deliberations and the South Coast Labour Council is happy to appear as witness to your proceeding should you deem this helpful.

2. About the South Coast Labour Council

The South Coast Labour Council is the peak union body on the South Coast of NSW and covers the area from Helensburgh, South of Sydney to the Victorian border and across to the Southern Highlands and adjoining tablelands in the west. The Council represents 25 affiliates across all industries and sectors and a unionized membership of almost 50,000 workers. This includes workers in the Steel, Mining, Maritime, Construction and Energy sectors. Advocacy for working people and their rights at work is a principal role of the Council as is the industrial development of the region's traditional and emerging sectors.

3. Hydrogen and the Illawarra

3.1 The Steel – Hydrogen Nexus

The global movement toward the decarbonization of industrial processes is gathering momentum. Whilst energy, transport and construction processes have clear options for transformation, steel is widely regarded as the last and most difficult major industry to decarbonise given the chemical and technical obstacles in the production processes involved in blast furnaces which account for the majority of global steel production. This is also the method of steel making employed at the BlueScope plant in Port Kembla. In essence the coal is used not only as part of the final chemical composition of steel but also and in much greater quantities, in deoxidizing the iron ore.

The advent of Hydrogen as a replacement for coal in this process is what has become known as 'green steel' and is currently being trialled internationally in very small scale but promising production processes. If successful, the estimates for at scale commercial production from Industry and other experts range from 10-20years. Importantly here, the volumes of hydrogen required are massive and would require sufficient lead in time to support this change in the process and secure the requisite continuous supply of hydrogen.

To understand the scale here in terms of amount of hydrogen and the renewable power required to make it, let's take the calculations from the most recent and credible study from the briefing paper to the European Parliament in December 2020.

50kg Hydrogen is required to produce 1 tonne of steel.

50-55Kwh of power is required to make 1 kg of Hydrogen.

Therefore, 2.4Terra Watts of power would be required per million tons of steel.

Now given that the Port Kembla plant produces 2.5 – 3 Million tons of steel per year, this would equate to well over 5 Terra Watts of power. To put this another way, that is equivalent to 800-1,000 mid sized wind turbines and needless to say the largest hydrogen production facility in the country.

This in itself represents a strong and we believe compelling argument to base a hydrogen hub and plant in Port Kembla and would justify preparatory work and technical studies to ensure the generation, transmission and production infrastructure considerations are addressed early in the piece so that all options can be explored.

3.2 Off-shore Wind: Power Options for Hydrogen Production

It is clear that demand for renewable power will increase if the growth in the hydrogen industry in Australia were to follow the international trajectory of projected demand.

This is in addition to the renewable energy targets that may be set based on aggregate power demand of general consumers. In these circumstances the option of developing clusters of off-shore wind turbines along the coast east coast of Australia including off the coast of Port Kembla becomes attractive. In general terms the benefits include:

- Fewer topographical and environmental considerations
- New generation of floating systems that are tethered as opposed set into the sea-bed
- Much Stronger wind patterns 20-30km offshore than most other locations on shore
- The ability to link via submarine cable to Port Kembla industrial precinct and hydrogen facility
- Less constraints on scale and number of turbines

We fully support the more detailed submissions of our affiliate the Maritime Union of Australia in relation to off-shore wind and note, in particular that an amendment and extension of the scope of Renewable Energy Zones to include off-shore wind generation would be required to enable these options to be pursued and further planning and assessment undertaken.

3.3 Hydrogen Production and Jobs

As described above, satisfying the rapidly growing demand for hydrogen will require the manufacture of not only new hydrogen production, storage and distribution facilities and systems but also additional supply of renewable energy technologies. Whether through wind, solar, hydro or a mix of the three, it is clear that additional renewable capacity will be 'steel heavy' in their manufacture. Wind turbines, for example require 120-180tons of steel per megawatt capacity according to one of the world's largest steel makers. This should mean they are jobs positive if and only if Government policies ensure local steel procurement and industry development plans and support are put in place now, not after the plants are constructed.

There are various scenarios as to job creation potential depending on scale and nature of operations and the timeline of activities. What is clear is that the steel industry sustains thousands of jobs directly and indirectly in the Illawarra and major operations relating to steel making and or energy production will certainly promote significant employment in the region and a significant multiplier effect on the region's economy. See for example a Report prepared by the researchers from the University of Wollongong during the international steel crisis in 2015 as to the impact of steel and related industries on the regional economy.

3.4 Port Kembla – Deep Water Harbour, Road and Rail Infrastructure

A great strength of Port Kembla is the presence of industrially capable infrastructure which relates to its history as a steel, coal, manufacturing and maritime centre over a century. The deep water harbour, as detailed in other submissions, is capable of handling transportation by sea of hydrogen in various forms and the road and rail infrastructure meets high specifications that have been required for the steel and manufacturing industries. In this respect, the track record of Port Kembla speaks for itself given that the major Esso Platforms project and the Sydney Harbour Tunnel sections were manufactured in this port.

3.5 **The potential role of the University of Wollongong in Steel and Hydrogen research and development**

The University of Wollongong (UoW) has a long and enduring relationship with local industry, in particular with BlueScope Steel operations at Port Kembla. Both Academic and Professional staff at the University have forged and maintained key relationships with BlueScope staff, with particular reference to Smart Infrastructure Facility, the Sustainable Buildings and Research Centre, the Steel Research Hub.

With strategic, targeted Government and industry investment in Clean Hydrogen Research and Development at UOW over the next 10 to 15 years, NSW and Australia can be at the forefront globally of Clean Hydrogen based Steel production. In addition, with access to the already established deep water harbour at Port Kembla and a Wollongong population with a

unique high skill base in research and its application to heavy industry, the Illawarra can and should become over the next 10 to 20 years a key Cleaner Steel and Clean Hydrogen export base to Asia, Europe and the Middle East.

UoW currently employees around 2,500 FTE staff and is among the largest employers along the NSW South Coast. With the right, targeted support, balanced with the renewed engagement of major industry players, a dedicated Clean Steel and Hydrogen Fuels Research facility established at UoW will be perfectly positioned to both reduce emissions and allow Australia to compete domestically and internationally in a carbon constrained global economy.

3.6 Community Support and Broad Consensus for Hydrogen and Renewable Technology in the Illawarra

The South Coast Labour Council was the key driver and Chair of the Green Jobs Illawarra project which was launched by the NSW Premier in 2009 and continued under the umbrella of RDA Illawarra for many years following. It was an inclusive strategy that used the competitive advantages of a steel making region in an energy revolution that is dependent on technologies largely manufactured from steel. 10 years on and we have a greater urgency for the manufacture and development of these technologies and unlike the past, a change in at least state Government policy. Our region has been waiting a long time for this change and will embrace the opportunities that it offers. *Recharge Illawarra* was formed to facilitate investment and project opportunities in this space and to ensure that our region benefits from the jobs and economic development that these industries may bring.

A hydrogen plant in Port Kembla would be a great start.

3.7 **Concluding Remarks and Invitation to Visit the Region**

We would like to extend an invitation to the Committee to visit our region and see first hand the industrial capacity and other advantages that our region holds for the location of a hydrogen industry. We are willing to appear as a witness before the Committee.

We would also be happy to hold another roundtable of key stakeholders as we did last year with BlueScope, the University of Wollongong, manufacturers and our affiliates if this is requested.

Thank you for considering our submission

Arthur Rorris

Secretary
South Coast Labour Council