Middle Arm Sustainable Development Precinct.

The proposal for a Middle Arm Sustainable Development Precinct (MASDP) in its current form presents a series of severe risks to the environment and the economy of the Top End.

The proposed intensified industrialisation of Darwin harbour with the introduction of multiple, high-risk industries will significantly impact Darwin harbour in a number of unacceptable ways.

The project appears doomed to fail on economic and environmental grounds and the very name of the project, Sustainable Development precinct indicates the complete lack of a realistic basis for the plans.

There is no realistic pathway from which a fossil-fuel based development, at this point in history, will be able to deliver sustainability outcomes and it has no chance of meeting the requirements of intergenerational equity nor environmental requirements in relation to climate change and emissions.

If the feedstock sources and processes, which include hydraulic fracturing, and the associated carbon emissions and costs they entail are considered it is even less likely to be feasible on the core principles of ESD such as intergenerational equity.

The environmental, social, cultural, and recreational values of Darwin harbour are seriously threatened by this proposal and the public must be fully informed about the potential impacts of each component of the plan and given appropriate opportunity to discuss the implications.

The residents of Darwin and Palmerston love Darwin harbour and want to see it remain safe and healthy for the decades to come, and that any development needs to be compatible with the long-term sustainability of the harbour.

The Precinct would contain petrochemicals, renewable hydrogen, carbon capture and storage, and minerals processing industries. The MASDP would be located within 3kms from the City of Palmerston. The proposal to use fossil fuels as the core feedstock mean that this precinct cannot be made sustainable and the use of the term shows the proponent is trying to mislead the community. Carbon capture and storage is not a sustainable solution in relation to carbon emissions and is especially risky in relation to costs and the risks of stranded assets eventuating from investments of this nature.

The four petrochemicals that are named by the proponent are ammonia, ethylene, urea, methanol, and they would be produced using gas either from the offshore Barossa field or fracked Beetaloo gas as a feedstock.

Many Petrochemicals and the processes involved in their uses threaten human health. The seventh compendium details many of these concerns and risks and it is folly for the NT to be considering such moves at a point when significant moves to reduce carbon emissions are underway on a global scale and health issues are emerging from the research into these fossil fuel based processes[1].

In the proponent's own documents, they have identified that "significant adverse impacts to human health may occur from dredging, major hazardous facilities, operations and shipping". The

[1] Concerned Health Professionals of New York, & Physicians for Social Responsibility. (2020, December). Compendium of scientific, medical, and media findings demonstrating risks and harms of fracking (unconventional gas and oil extraction) (7th ed.). http://concernedhealthny.org/compendium/

development of a petrochemical hub poses the most serious risks to human health, in terms of pollution and air quality. More studies are needed to fully investigate the link, but there is evidence to indicate that "human exposure to certain carcinogenic pollutants emitted from petrochemical industries might increase the incidence of some cancers and cancer mortality"[2].

Further it provides significant economic risk to future generations and wasted opportunities in relation to the Northern Territory participating in the renewable energy revolution. Such a precinct will lock in high uncompetitive costs and create stranded assets, wasting the investment of funds that should be supporting future generations of Territorians.

As an example, the idea of creating fertilisers like urea from fossil fuels is past its peak opportunity time. Fertiliser plants are being built that will do this with renewable energy and join the Hydrogen and Nitrogen molecules to form ammonia without the carbon and energy issues generated by fossil fuel use in this process. There are multiple renewable based projects already under development that will be competitors to this precinct.

This precinct will be economic suicide when looking at likely scenarios that will be in place by the time any such plant is operational. As an example, many farming and agricultural pursuits are pushing towards carbon neutrality, especially by 2050. So, if a business needs to purchase fertiliser and it has a choice of sourcing one that is carbon neutral from renewable sources or one that carries significant carbon penalties through using fossil fuel in the production process, it is clear that they will choose the low carbon source, doubly so when it is likely to be the cheaper option as well.

There are very significant changes in community expectations relating to carbon footprints of developments and production processes and also legislative requirements, for example carbon adjustment taxes such as those implemented in the EU, relating to the carbon footprint of production that do not appear to be factored into the risk assessment for this precinct. Ignoring the environmental reality of these issues carries a massive financial risk of stranded assets as highlighted in the IPCC sixth report.

I am particularly concerned about how we get to make detailed input into this process as there are a range of complex economic, social and cultural issues across the implications of fracking and downstream processing that will have major impacts in the NT.

The MASDP proposal facilitates this gas industry expansion through the greenwashing of carbon capture and storage (CCS), increasing demand for gas through use as a feedstock for petrochemicals, and expanding gas processing. CCS is not going to provide a long-term solution and is shown by research to create more carbon pollution[3].

Given the peer reviewed research it is little surprise that CCS has repeatedly failed to produce economic or carbon capture results. CCS is not a proven or effective technology for reducing emissions. Indeed, CCS is being used by Santos to "rationalise – and subsidise – continued investment in fossil fuel infrastructure that would lock in emissions of CO2 and other pollutants for decades to come."[4]

The Climate Council has said that CCS is a "licence to ramp up emissions"[5]. The Australasian Centre for Corporate Responsibility states that "the rate of CCS project failure is striking: a recent study of

[2] https://pubmed.ncbi.nlm.nih.gov/32283337/

[3] Robert W. Howarth, Mark Z. Jacobson, 2021 How green is blue hydrogen? Energy Science & Engineering

[4] https://www.ciel.org/reports/carbon-capture-is-not-a-climate-solution/

[5] https://www.climatecouncil.org.au/resources/what-is-carbon-capture-and-storage

all CCS developments in the United States of America (home to a significant majority of the world's CCS capacity) found that more than 80% had ended in failure[6].

For a project with such damaging environmental implications it would have to extraordinarily profitable to provide any net benefit, say for example a Norwegian Sovereign Wealth Fund type of benefit. Far from this the precinct will be an economic millstone around the neck of future generations of Territorians.

The hype around these sorts of fossil fuel projects is never accurate and the actual economic consequences can be quite severe as shown by the Ohio Institute reports on the outcomes of the Marcellus Shale development in the USA. Summed up by John Hanger, former Pennsylvania secretary of Environmental Protection

> *This report documents that many Marcellus and Utica region fracking gas counties typically have lost both population and jobs from 2008 to 2019. This report explodes in a fireball of numbers the claims that the gas industry would bring prosperity to Pennsylvania, Ohio or West Virginia. These are stubborn facts that indicate gas drilling has done the opposite in most of the top drilling counties,"*[7]

and Kathy Hipple, BARD college Professor of Finance ORVI report

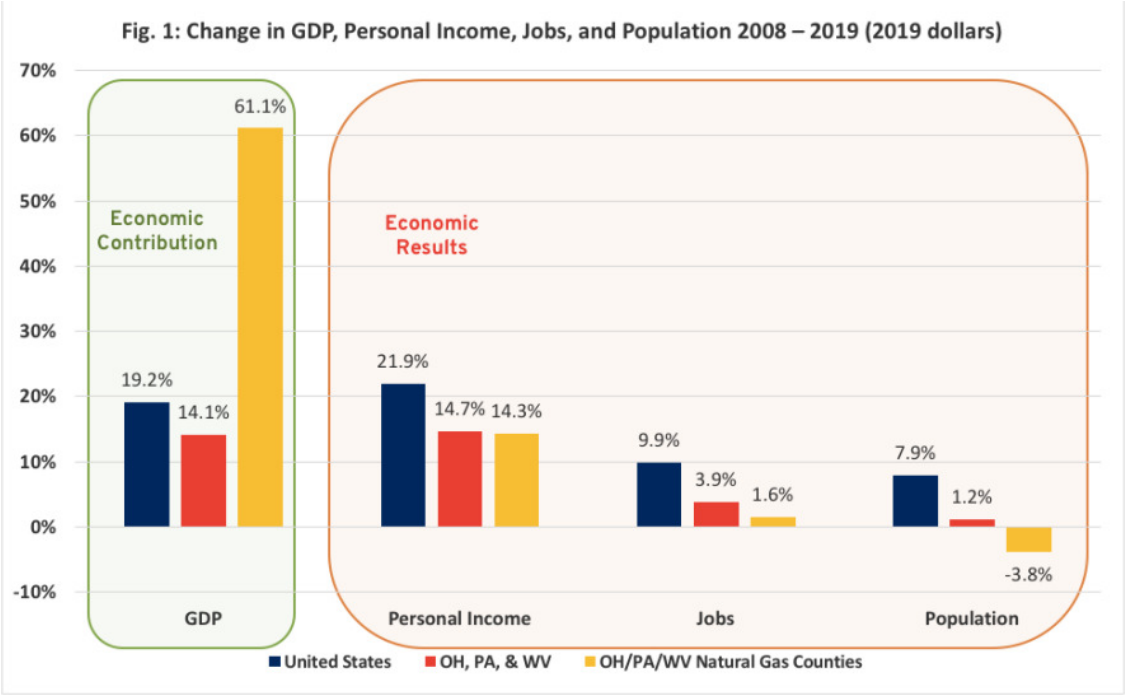
> *"This detailed report is another indictment of fracking. The business case for fracking has never been proven. The Appalachian shale gas producers have been spectacularly unsuccessful financially, despite impressive production gains. Many have filed for bankruptcy. Others have taken massive write-offs. This financial failure of the natural gas sector extends to local communities." Hipple concluded, "Simply put, the natural gas industry has not delivered the promised benefits for producers, investors — or local communities."*

We repeatedly hear for APPEA, Federal ministers like Angus Taylor and Keith Pitt and from NT Government ministers that there is a jobs boom to be had from the development of the Beetaloo basin gas reserves and projects like this precinct.

There is little evidence to support this, but there is evidence to show it is untrue from the Appalachian region in the USA where the data is clear.

The US study compared the pre-fracking estimate of the creation of hundreds of thousands of new jobs in 22 affected Ohio, Pennsylvania, and West Virginia counties with the post fracking 2019 reality (refer graph below)[8]. It was found that, whilst the fracking economic activity contributed to significant GDP[GSP] growth, this did not translate to local jobs and population growth. The study author named this affect 'the resource curse', it is also referred to as Boomtown syndrome.

[6] https://www.accr.org.au/downloads/accr-ccs-erf-method-submission_july-2021.pdf.
[7] https://ohiorivervalleyinstitute.org/fracking-counties-economic-impact-report/
[8] https://ohiorivervalleyinstitute.org/wp-content/uploads/2021/02/Frackalachia-Report-update-2_12_01.pdf



Sources: U.S. Bureau of Economic Analysis
QCEW Data: U.S. Bureau of Labor Statistics

Ohio River Valley Institute

The ORVI report showed that the actual outcome was quite different for these states where the fracking was conducted.

Their share of the nation's personal income fell by 6.3%, from $2.62 for every $1,000 to $2.46.
• Their share jobs fell by 7.6%, from 2.71 in every 1,000 to 2.5.
• Their share of the nation's population fell by nearly 11%, from 3.26 for every 1,000 Americans to 2.9 for every thousand.

The grand plans for this region in the USA included the development of plastics a fertiliser plants which were found to not be economically viable in the more favourable cost structures relation to fossil fuels in the USA in 2010-2017.

The issues that have emerged from fossil fuel based development around Gladstone harbour [9]need to be carefully analysed as similar problems in Darwin harbour are already causing significant community concern from just two LNG facilities.

In short, this proposal is the wrong plan at the wrong time in history for the Northern Territory. Such a precinct may be possible based on renewable energy but is not feasible based on fossil fuel driven processes.

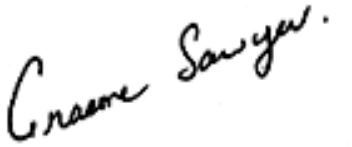
The ORVI report shows that such plans were not viable in 2017 and they are even less viable today. Limited opportunities for downstream value-adding development. Since the Appalachian fracking boom began, later economic impact studies, such as one done in 2017 by the American Petroleum Institute, have anticipated massive job expansion resulting from regional growth of downstream

[9] https://www.crikey.com.au/2011/11/24/erin-brockovich-on-gladstone-harbour-case-as-dredging-crisis-deepens/

industries, including petrochemical and plastics manufacturing. The expected expansion has largely failed to materialize. Of the nine major projects anticipated in the 2017 ACC study, only one—an ethane cracker plant in Pennsylvania —has been greenlighted. At the same time, production capacity along the Gulf Coast and in China and the Middle East has been exploding, creating an overabundance of supply. Also, concerns about climate change and plastics pollution are threatening the size of expected increases in demand for plastics. As a result, the prospects for major expansions in downstream industries in Appalachia are at best uncertain and dim overall.[10]

I can be contacted to provide more detailed information and explanation about the points raised.

Yours truly,



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[10] The Natural Gas Fracking Boom and Appalachia's Lost Economic Decade Appalachia's Natural Gas Counties (Updated February 12, 2021)