OXFORD ECONOMICS

REVIEW OF THE ECONOMIC IMPACT STUDY OF ARC21 RESIDUAL WASTE TREATMENT PROJECT

ARC21

JANUARY 2019

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The modelling and results presented here are based on information provided by third parties, upon which Oxford Economics has relied in producing its report and forecasts in good faith. Any subsequent revision or update of those data will affect the assessments and projections shown.

To discuss the report further please contact:

Neil McCullough: nmccullough@oxfordeconomics.com

Oxford Economics

Broadwall House, 21 Broadwall, London, SE1 9PL, UK

Tel: +44 203 910 8000

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1. INTRODUCTION

1.1 BACKGROUND

In 2013, Oxford Economics undertook a detailed economic impact assessment of the proposed arc21 Residual Waste Treatment Project. In doing so we quantified the economic contribution of the investment, assessed how it aligned and supported policy and provided wider analysis of the local economy to understand the context within which to consider the proposed investment. Following receipt of Strategic Planning's Statement of Case in 2016, we reviewed some of the underlying modelling assumptions used in the 2013 work. We concluded at that time, the assumptions remained robust and should not be changed.

1.2 HEADLINE FINDINGS OF ORIGINAL WORK

We estimated that:

- The £300m of capital investment would create or sustain 6,045 jobs, with £122.1m of associated wages and £215.1, of GVA during the construction phase.
- Once operational, it would create or sustain 337 jobs per annum with wages of £7.7m and make £24.6m of GVA contributions.
- Total tax revenue from the construction phase would be £48.8m while the operation phase would yield tax receipts of £3.1m per annum. In additino, unemployment savings were estimated to range from £16.3m to £32.3m over the period of construction and £0.9m to £1.8m per annum when the project becomes fully operational.

We also found that the investment supported existing environment and economic policy / targets. We also found that it would provide a much-needed injection of economic demand in an economy facing a challenging outlook.

The findings from our original work were then assessed by the Department of the Environment and Economics Branch. It concluded that there were no economic grounds for objection.

1.3 THE PURPOSE OF THIS PAPER

A range of factors have changed since the original work in 2013 and the review of modelling assumption in 2016, which may alter the impacts concluded in our original report:

- The calculations and figures presented in the report were based on the most recently available data at the time. New data for the intervening period has been released by NISRA and ONS. As our assessment below shows, this does not lead to any material difference in our forecast, modelling results or overarching conclusions.;
- Similarly, there are more up-to-date Input-Output tables, and academic guidance on their application to estimating sub-national economic impacts. Again, we assess these in this report and conclude that our finding that the proposed investment would lead to significant economic benefits still hold; and

- Finally, the overall political and socio-economic environment has changed. There are a variety of macroeconomic and local drivers of these changes, some of which were captured in our original forecasts. To understand the role of these changes we explore the outturn of a range of key variables against our original forecast. Again, we conclude that our original findings remain robust.

The objective of this report is to review the original work that was carried out in 2013 and revisited in 2016, in light of the new data, recent developments and future trends.

2. METHODOLOGY

2.1 INTRODUCTION

Since the 2013 report there have been more up to date input-output tables published and further developments in the field of local economic modelling.

To assess the continuing validity of our 2013 findings we consider the likely impact of updated input-output tables and new approaches to local modelling and consider whether these factors have a significant impact on the earlier assessments and conclusions.

2.2 UPDATED INPUT-OUTPUT TABLES

The original report estimated the indirect and induced impacts of both the construction and operational phases of the project using UK input-output tables. At the time or writing the 2013 report the latest set of detailed tables available were from 2005. These have subsequently been superseded by a more recent (2013) release.

The interlinked relationships between different sectors of the economy evolve over time and can alter the scale of impacts. We have found in previous studies that introducing new input-output tables to our models have dampened the supply chain impacts. However, the magnitude of the changes is relatively small and simply reflect the increasing globalisation of the local economy (i.e. Northern Ireland and the UK buy increasingly more products and services from elsewhere meaning supply chain spending leaks out of the economy slightly faster than before).

Whilst there are no readily available Northern Ireland multipliers published, we can draw on published economic multipliers for the Scottish economy as an indication of magnitude. This is standard practice and provides a robust basis for assessment. We use these multipliers as a guide to what we might expect by introducing new input-output tables to the analysis. The type 2[1] GVA multiplier for construction has changed little over time. It was 2.1 in 2010 and fell to 1.9 in 2014, before rising to 2.0 in 2015. The type 2 employment multiplier for construction fell from 1.9 in 2010 to 1.8 in 2011 where it remains (in 2015). Likewise, the type 2 income multiplier has fallen from 1.9 in 2010 and sits at 1.8 in 2015.

Even though we would expect the supply chain and perhaps consumer spending impacts to be reduced marginally by updating the input-output tables, the overall positive impact of the investment (both during construction and operation) is unlikely to change materially.

Therefore, there is no fresh data to suggest that the 2013 conclusion that the investment would have a significant net positive impact would change.

[1] Type one multipliers consider only the indirect impacts of an investment. Type two consider both the indirect and induced impacts.

2.3 AMENDED APPROACH TO CALCULATING LOCAL ECONOMIC IMPACTS

Input-output modelling is an evolving field. Following the original report, the literature on estimating local or sub-national impacts has developed.

Previously, Oxford Economics used national spending patterns contained in the UK input-output models and adjusted them down to reflect the sectoral structure of the Northern Ireland economy. We did this using location quotient analysis[2] on detailed sectoral employment. Where sectors had a below average number of jobs (relative to the UK) we assumed less of what was required in the supply chain could be found in the region (i.e. more needed to be imported) and reduced the supply chain spending accordingly. In doing so the Northern Ireland multipliers were obviously smaller than those for the UK.

Our standard approach now is based on the latest academic papers and involves adjusting national Input-Output tables using Flegg location quotients.[3] This is a similar approach to that used in the 2013 study. The latest approach ensures that the impacts within a given area again reflect the characteristics of the local economy (as we did before), but the new approach also factors in the size of the economy.

This slight change in approach to how we model local and regional economic impacts is likely to have a larger impact on our estimates than the new input-output tables discussed in 2.2. Given the academic papers by Flegg and others suggest older techniques overestimate local impacts, revised multipliers would be lower than those originally produced in the 2013 study.

However, an investment of this scale will still have significant economic benefits to the local and regional economies. To put this size of this investment into perspective, the proposed investment is worth more than the £187.23m invested by externally-owned businesses receiving Invest NI support in 2016/17[4]. Therefore our 2013 conclusion of a net positive impact stands.

[2] In location quotient analysis we calculate the share of regional employment in a given sector and divide it by the national share. In other words, if finance accounted for 10% of jobs in Northern Ireland and 20% in the UK, then finance would have a location quotient of 0.5 in Northern Ireland reflecting the sector accounts for half the number of jobs you might it expect it too given the national average.

[3] Outlined in further detail in papers such as Flegg, A. T. and Tohmo, T. (2013) “Regional input-output tables and the FLQ formula: A case study of Finland” (Regional Studies, 47 (5). pp. 703-721).

[4] https://secure.investni.com/static/library/invest-ni/documents/investni-support-council-all-northern-ireland-12-13-to-16-17.pdf

3. SOCIO-ECONOMIC CHANGES

3.1 INTRODUCTION

We assess the factors that may lead to differing results, and whether they would—both individually and in combination—result in materially different conclusions to those presented in the original report.

We first present a comparison of our original forecasts for a range of variables, comparing this view with our current forecasts (as of December 2018), which includes the outturn of actual data in subsequent years. Building on this, we will broadly replicate the structure of the original report, considering the extent of any changes to each of our calculations in turn.

3.2 CHANGES TO THE ECONOMIC OUTLOOK

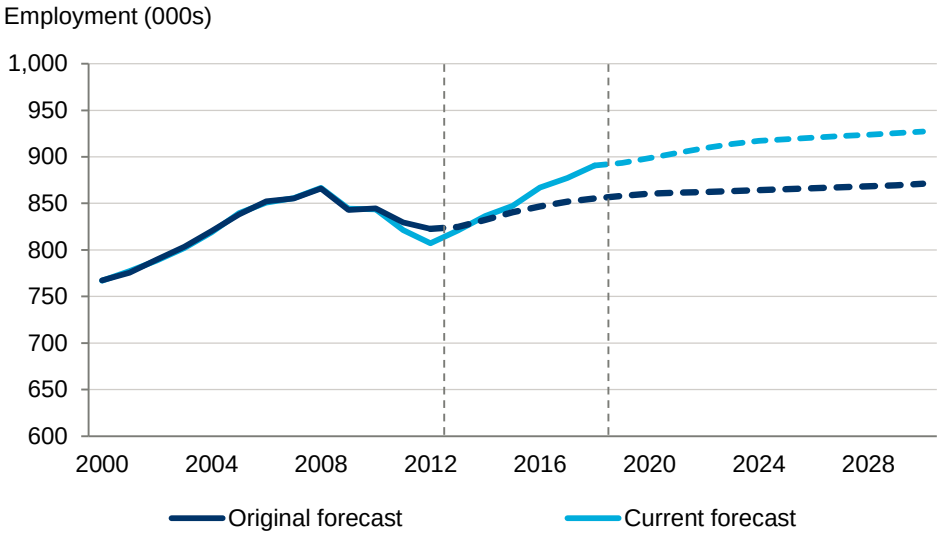
In this section we consider how the Northern Irish economy has performed in recent years relative to our original forecast. Local authority boundary changes are a complicating factor in comparing across the 'arc21' region.[5] Owing to the boundary changes, which amalgamated 26 councils into 11 local government districts, we are unable to provide an exact like-for-like comparison for this sub-regional area. Instead, we consider the overall levels of change across Northern Ireland as a whole.

The outturn levels of employment across Northern Ireland indicate greater-than-expected growth. The labour market has outperformed expectations across the UK. This partly reflects the reluctance to invest in capital to expand production and meet demand. Given Brexit related uncertainty, firms have been delaying or cancelling investment projects that would have boosted productivity. Instead they have been quicker to employ individuals to expand production.

Our original forecast estimated employment would rise to 855,400 in 2018. Our current forecast estimates the figure to be 890,700 in 2018, meaning that the Northern Irish economy supports 35,200 more jobs than originally expected now. As a proportion of the total—4.1 percent—the magnitude of this difference is unlikely to have a significant effect on our findings.

[5] Comprising eleven councils.

Fig. 1. Comparison of total employment forecasts, 2000 to 2030

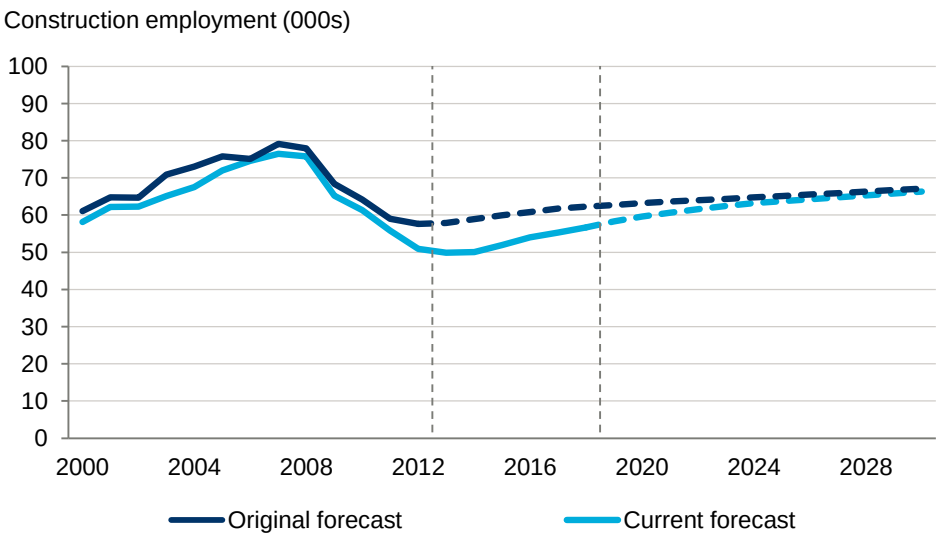


Source: Oxford Economics

Historic sectoral data has been subject to revisions, which has altered the profile of construction employment. This sector has seen a proportionately larger contraction in the historic estimate for 2012, equivalent to 6,700 jobs. However, this difference is offset by stronger-than-anticipated growth to 2018. The difference between our original and current view of employment equates to 5,900 less jobs. Construction employment remains 19,700 jobs, or 25 percent, lower than its pre-recession peak. Over the longer run, we believe the two forecasts will converge to a level broadly similar with one another.

Therefore, the construction sector has found it more challenging to create employment opportunities than we originally anticipated and our original conclusion that the £300m investment would boost the sector remains robust.

Fig. 2. Comparison of construction employment forecasts, 2000 to 2030



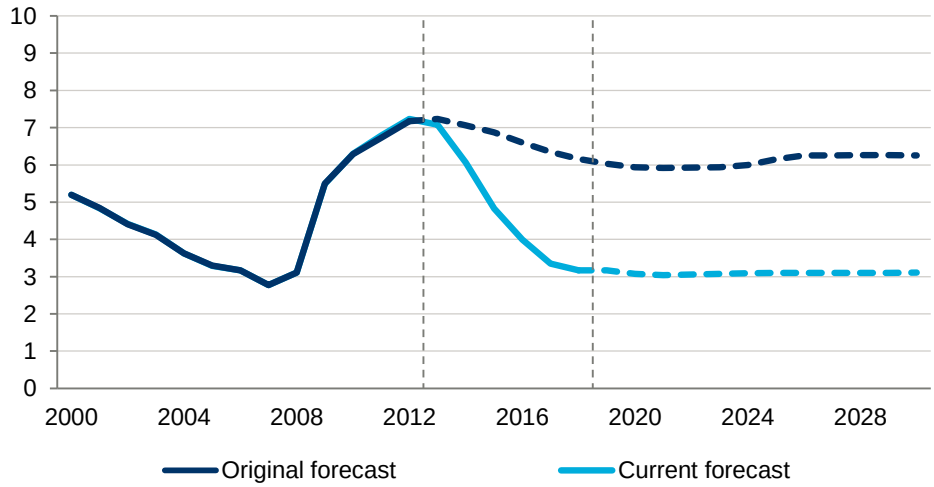
Source: Oxford Economics

Stronger than expected employment growth, coupled with lower levels of net migration, have resulted in a greater tightening of the labour market in the

intervening years between the two forecasts than originally expected. Although our original forecast assumed that unemployment would contract by one percentage point between 2012 to 2018, the observed outcome is 4.1 percentage points (as noted, this reflects the private sector's recent preference to hire labour rather than invest in capital projects). Current estimated unemployment (3.2 percent in 2018) is 3 percentage points lower than the expected value. Although the unemployment rate is still above its historic low, 2.8 percent in 2007, on face value there would appear to be little spare capacity in the labour market.

Fig. 3. Comparison of unemployment rate forecasts, 2000 to 2030

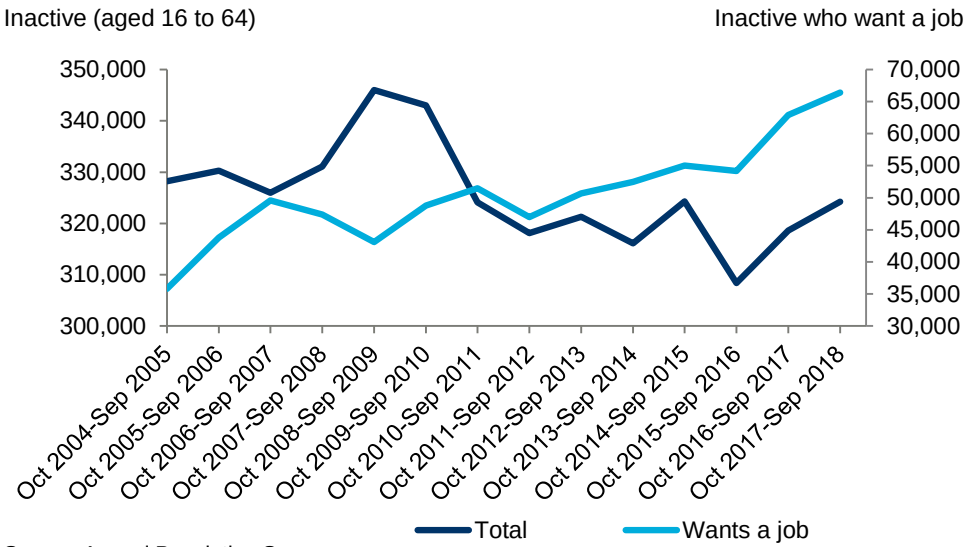
Unemployment rate (% of the labour force)



Source: Oxford Economics

However, data from the Annual Population Survey shows that despite rising employment and falling unemployment, there remains a large share of working age population economically inactive. Importantly the proportion of this group of inactive who want to work is rising. At the time of our last analysis 15.8% or 50,700 of the inactive working age wanted a job. The most recent data suggests this has risen to over a fifth of the inactive population or 66,400 people. There is therefore still capacity in the labour market to accommodate the additional demand for labour that would arise from the proposed investment. Reducing the number inactive would also support local economic policy objectives and could help tackle deprivation and related health, crime and social challenges that are closely correlated to it.

Fig. 4. Inactivity and the number who want a job, Oct 2004 to Sep 2018

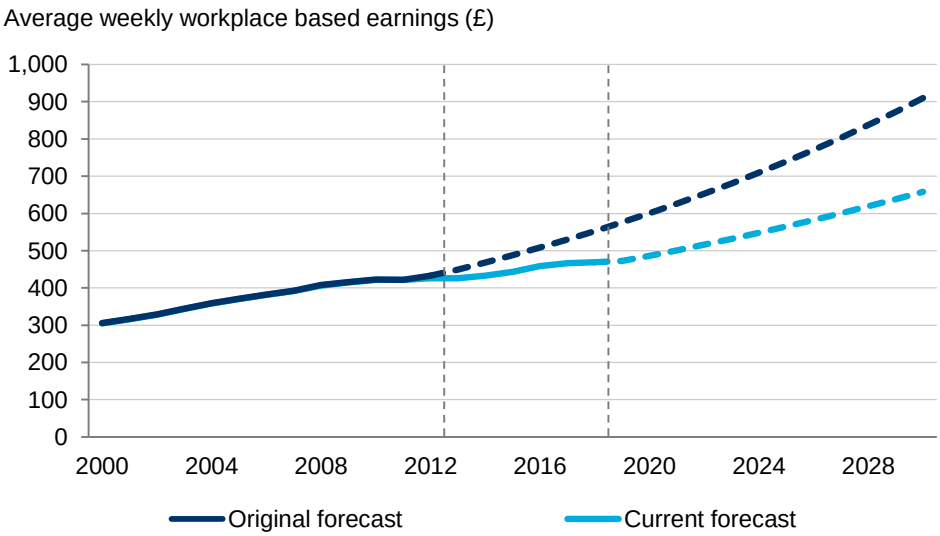


Source: Annual Population Survey

Another indication of spare capacity is that growth in employment has not fed through to workforce earnings. Typically, as a labour market tightens (in other words spare capacity is reduced), employers bid up wage levels to secure labour. Owing in part to the 'productivity puzzle'—relatively weak productivity growth experienced across the UK economy since the recession in the late 2000s—earnings have grown below anticipated levels. Although presented in nominal prices below, Northern Ireland's real terms earnings (which account for inflation) have barely increased between 2012 to 2018.

Given the evidence of spare capacity, and lack of evidence of any wage growth, we can continue to conclude that there is little risk that the proposed investment would result in displacement.

Fig. 5. Comparison of workplace-based wages forecasts, 2000 to 2030



Source: Oxford Economics

3.3 OVERVIEW

Recently published data and revised forecasts continue to show an economy facing a subdued outlook. We continue to forecast employment growth that's slower than that enjoyed from 2000 to 2017. The construction sector is still considerably below peak activity and our 2030 forecast is similar to that presented in the original report.

Despite a tighter labour market than previously forecast, the Northern Ireland economy still has spare capacity and has not enjoyed any notable growth in rising real wages and our forecasts are more subdued than previously estimated. Therefore, the proposed investment will continue to take place against a challenging economic outlook and our original conclusions that the project would bring a much-needed injection of demand still hold, as do our assumption that displacement levels would be limited.

The data assessed and the conclusions that flow from that material confirm that the original conclusions and the basis for assessment remain robust.

4. ESTIMATED ECONOMIC BENEFITS

The original report identified the total benefits of the construction and operational phases to equate to £215.1m and £24.6m of GVA per annum respectively, in 2009 prices. It identified a range of additional benefits relating to employment and wages.

4.1 EMPLOYMENT AND WAGE IMPACTS

These estimates were derived from the cost of construction, and the operational employment space generated by the scheme (including ongoing operation of the facilities and the Administration & Visitor Centre). Neither of these factors has changed since the original report.

In our modelling we convert output into GVA, with employment and wages impacts estimated using Oxford Economics' forecasts for sectoral productivity (the average output per worker) and sectoral earnings. As we have shown previously, employment levels have exceeded our original forecast, although this is largely offset by weaker nominal wage growth. We consequently expect the inclusion of new data and forecasts to have only a minimal impact on the overall economic benefits of the scheme.

4.2 DISPLACEMENT

The original report considered the role of displacement. After analysing the available data, displacement rates were set to zero based on the following factors:

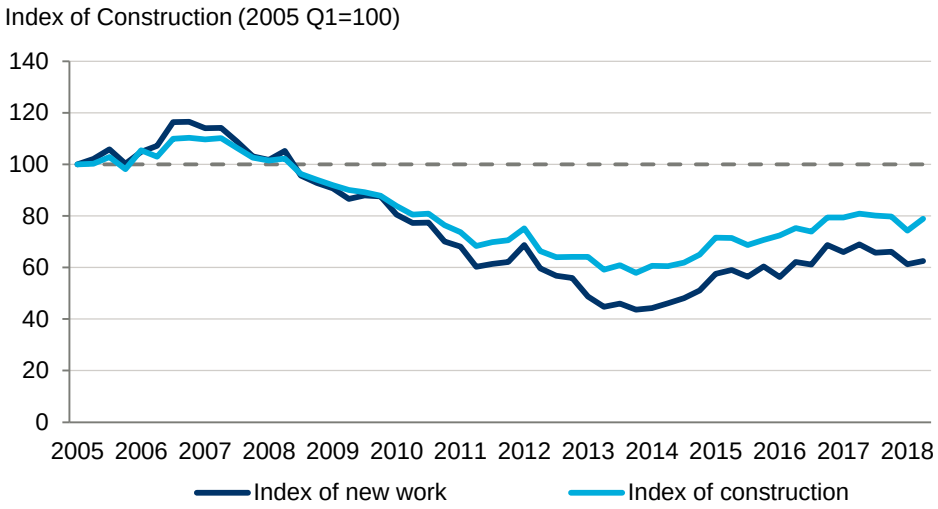
- The niche type of project in question, which it was assumed was unlikely to draw away workers from other residual waste treatment projects across Northern Ireland; and
- Spare capacity in the construction sector. The report identified that the *"construction sector has suffered the largest amount of recessionary job losses of any sector"*. At the time of writing, the economy was still recovering from the global financial crisis and subsequent recession.

Our assumptions were reviewed and accepted by DoE Economics Branch, and the officer report stated that:

> *"the size of the impact is likely to be relatively small. Therefore, I am content with the treatment of displacement in the study."*

As noted above, we remain content with the robustness of the original assumptions. Using the Northern Ireland Index of Construction and rebasing figures to align with the original report, we can demonstrate that—while the construction sector has demonstrated a partial recovery—it continues to lag behind pre-recession levels. As such, our conclusion from the original report remains unchanged.

Fig. 6. Indices of construction and new work, Northern Ireland, Q1 2005 to Q2 2018



Source: Northern Ireland Index of Construction

4.3 FISCAL IMPACT

The original report also detailed the fiscal benefits of the scheme. It assessed this through two channels: the additional revenues generated from increased job creation (through income tax and National Insurance Contributions); and by extension the reduced welfare spending resulting from reduced unemployment, as those who would otherwise be unemployed may be able to find work.

Following lower than expected growth in earnings, we expect that the overall additional wages resulting from both the construction and operational phases of the scheme will fall slightly relative to the figures stated in the original report. By 2018 the average weekly wage across Northern Ireland is estimated to be £80 (in 2016 prices) or 15 percent lower than anticipated in our original forecast.

The profile of income tax has also changed. Both the personal allowance and basic rates of income tax have increased between 2012/13 and 2017/8, above the rate of inflation.[6] This is likely to reduce the direct income tax revenues estimated to be generated by the scheme.

Similarly, although the unemployment rate has fallen to a greater degree than originally anticipated, a sufficient stock of unemployed and inactive potential workers still remain that could find employment through this development, thus reducing benefit payments.

Our analysis of the scale of tax benefits therefore suggests that, while the overall fiscal impact of the scheme may be slightly lower than expected—owing to a changing fiscal and economic context—the magnitude of these changes is likely to be small. The scheme will still generate a net fiscal benefit. As such

[6] Personal allowance has increased from £8,105 in 2012/13 to £11,500 in 2017/18, although the basic rate (20 percent) was introduced at a higher level of income (£34,370) in 2012/13 than in 2017/18 (£46,350).

our original assessment of a positive tax impact through the construction and operational phases remains unchanged.

5. UNQUANTIFIABLE BENEFITS

5.1 RENEWABLE ENERGY AND ENVIRONMENTAL TARGETS

Section 4 of the original report provides additional detail on the unquantifiable benefits of the proposed development, including its contribution to meeting local, regional and national sustainability and renewable energy targets. It details a range of unquantifiable yet important economic and social benefits that are likely to arise from the project.

The overall policy environment for renewable energy sources has evolved since the time of the original report. For instance, the EU has recently raised its target for the amount of energy it consumes from renewable energy, from the previous policy goal of 27 percent by 2030 up to 32 percent.[7] The UK's current rate of renewable energy consumption of 9 percent falls well below this target, meaning that schemes such as the proposed development will be making a positive contribution to the UK's capacity to meet this target.

Another example of an update in the policy environment in which the project can contribute is the Climate Change Act which has set a UK-wide target. This mandates more ambitious targets than the EU for 2020 (a reduction of at least 34% in emissions by 2020) and 80% by 2050. It also introduced legally binding five-year carbon budgets setting a limit to the amount of greenhouse gases the UK can emit. While there are no specific targets for the devolved administrations under the Climate Change Act, they must contribute to the overall UK target. Energy from Waste has an important role to play in this regard as by diverting waste from landfill it results in avoided emissions.

Therefore, as the policy environment has evolved, the scheme will play an increasingly important role in meeting the higher renewable energy targets.

5.2 ECONOMIC POLICY AND TARGETS

A review of economic policy targets shows little has changed since the 2013 study. The Northern Ireland Economic Strategy has not been updated, but the Draft Programme for Government has been produced. It covers the period 2016 to 2021 and builds on the original Programme, rather than being radically different. It therefore contains outcomes that are support by the proposed investment such as:

- We live and work sustainably – protecting the environment;
- We have more people working in better jobs; and
- We have high quality public services.

Since the original study the Department for the Economy has also released (in January 2017) the paper "Economy 2030: a consultation on an industrial strategy for Northern Ireland" which focuses heavily on Northern Ireland being competitive and successful in a global context. However, it also notes the

[7] https://www.theguardian.com/business/2018/jun/14/eu-raises-renewable-energy-targets-to-32-by-2030

importance of building a better economy for everyone in Northern Ireland and that growth must be for the common good. As part of this it has two ambitions that are relevant to this proposed investment:

- Driving inclusive, sustainable growth; and
- Building the best economic infrastructure (which the report notes includes energy and waste disposal).

The arc21 residual waste treatment project, including an energy from waste plant would support both of these ambitions by providing a mix of employment opportunities directly, indirectly and through consumer spending, whilst also delivering a key infrastructure asset.

The targets of the Economy 2030 paper are also supported by the investment. It could towards achieving the job creation target, helping inactive people back into work and growing the private sector.

At a local level, Antrim and Newtownabbey Borough Council published the report “Local Development Plan 2030 Towards Preferred Options” in January 2016. Again, the proposed investment aligns with its aims of:

- The promotion of sustainable economic development in an environmentally sensitive manner;
- Tackling disadvantage and facilitating job creation by ensuring the provision of a generous supply of land suitable for economic development;
- Sustaining a vibrant rural community by supporting rural economic development of an appropriate nature and scale;
- Supporting the re-use of previously developed economic development sites and buildings where they meet the needs of particular economic sectors; and
- Ensuring a high standard of quality and design for new economic development.

6. CONCLUSIONS

We have considered the various factors that have changed since the original report was published in 2013. The change in the input-output tables and approach to quantifying local impacts are likely to result in lower economic multipliers. We are certain that the proposed investment still provides a significant net economic benefit to the local and regional economies.

The economic environment is different from that experienced in 2013. While employment growth has out-performed our expectations, it has not been accompanied by growth in real wages. In addition, the uncertainty of Brexit has resulted in falling private sector investment across the UK, which explains the better than expected labour market performance. In addition, although unemployment is lower than expected, there remains a significant and growing group of working age people inactive, but who would like a job. Therefore, there is still capacity to absorb the proposed investment.

Having assessed relevant data, they do not significantly alter the basis of assessment or the robustness of the conclusions. The forecasts are not materially different from those in the original work. We still expect Northern Ireland to experience subdued employment growth over the forecast period, but this is now expected to be accompanied with lower real wages and slower wage growth. Consequently, multi-million pound investments by the private sector are just as important now (if not more so) than when we undertook the original work in 2013.

The proposed development continues to be consistent with environmental and economic policy.

The findings of the original report, that the proposed investment will bring a net positive economic benefit to Northern Ireland during a time of subdued growth, hold true.

OXFORD
ECONOMICS

Global headquarters
Oxford Economics Ltd
Abbey House
121 St Aldates
Oxford, OX1 1HB
UK
Tel: +44 (0)1865 268900

London
Broadwall House
21 Broadwall
London, SE1 9PL
UK
Tel: +44 (0)203 910 8000

New York
5 Hanover Square, 8th Floor
New York, NY 10004
USA
Tel: +1 (646) 786 1879

Singapore
6 Battery Road
#38-05
Singapore 049909
Tel: +65 6850 0110

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Asia Pacific

Singapore
Sydney
Melbourne
Hong Kong
Tokyo

Email:
mailbox@oxfordeconomics.com

Website:
www.oxfordeconomics.com