SUPPLY CHAIN SUSTAINABILITY SCHOOL

Delivering social value through offsite construction

Report from the Supply Chain Sustainability School, Akerlof, and the University of Salford

Glossary

Term - *Explanation*

Additionality - *An impact arising from an intervention that would not have occurred had the intervention not taken place*

Baseline - *The creation of a starting point to make comparisons between data points*

Design for manufacture and assembly (DfMA) - *A design approach which focuses on ease of manufacture and efficiency of assembly, inextricably linked to offsite construction*

Design freeze - *Completion and client's final approval of the design of an asset and associated processes after which no further changes are accepted*

Double counting - *Where an impact is attributed to two different interventions and the total impact is then at risk of being measured twice*

Embodied carbon - *Greenhouse gas emissions associated with extraction and processing of materials, energy and water consumption used in producing products, transporting material to site, and constructing the building*

ERP system - *Enterprise resource planning - a type of software used to manage day-to-day business activities such as accounting, procurement, project management, risk management and compliance, and supply chain operations*

ESG - *Environmental, social, and governance criteria: a set of standards for a company's behaviour used by investors to screen potential investments*

HACT - *The Housing Associations' Charitable Trust - a non-governmental organisation working within the social housing sector who have developed the UK Social Value Bank framework*

Impact - *The difference that is made to an individual, enterprise or wider society from an intervention*

Indicators - *Signals of performance and/or the likelihood of meeting targets*

Life cycle carbon - *The carbon emissions resulting from the materials, construction and the use of a building over its entire life, including its demolition and disposal*

LM3 - *LM3 (Local Multiplier 3) is a methodology that can be used by companies, governments, or community organisations to measure how their spending generates local economic impact and benefit to communities.*

Metrics - *Points against which data is collected to calculate indicators*

MMC - *Modern methods of construction: ways of working including offsite construction techniques and use of new technologies to improve productivity and efficiency*

Monetise - *To assign a financial value on a social outcome*

NEET(s) - *People not in education, employment or training*

Net-zero - *A state where greenhouse gases have been reduced as close to zero as possible with any remaining emissions compensated by absorbing from the atmosphere*

Offsite - *Construction method whereby components or elements of the built asset are completed in a manufacturing facility located away from the installation site*

Outcome - *Changes that stakeholders experience as a result of an activity or intervention*

Output - *Something that results from an activity or intervention*

Overclaim - *Overstating the impact you are making - this can occur if data capture and evaluation methodologies are not rigorous*

PPN 06/20 - *Procurement Policy Note 06/20 - taking account of social value in the award of central government contracts*

Premanufacture(d) - *Processes which reduce the level of on-site labour intensity*

Proxy values - *An approximation of value, typically obtained through preference-based methods e.g. willingness to pay, willingness to accept*

Section 106 agreement - *Planning obligation attached to land that is subject of a planning permission*

Social Value Act - *The Public Services (Social Value) Act, which came into force in 2013*

Social Value Model - *Government's social value priorities for procurement, including a menu of social value options for commercial staff in in-scope organisations to review and select with their internal clients and any other stakeholders*

TOMs - *The National Themes, Outcomes and Measures - one framework for measuring and reporting social value*

VCSE(s) - *Voluntary, Community and Social Enterprises*

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Foreword

Delivering value to communities is an inherent outcome of the new buildings and infrastructure that our industry constructs. If we are building a school, then we are creating space to allow for better education and life chances for local people.

In addition to these inherent benefits, the construction sector has for many years provided significant community benefits through the process of building; whether this is local jobs, spend with local suppliers, outreach to local schools or engagement with local colleges. Such benefits can be purposefully be enhanced: this can be through procurement or contract clauses and/or through planning conditions such as Section 106 notices.

In 2012 Government published the Public Sector (Social Value) Act clarifying public sector buyers' ability, and indeed duty, to look beyond price and consider the wider public value of any procurement. Then in 2020 came PPN06/20, a public procurement notice that put a mandatory 10% weighting on the social value accruing from the award of a contract.

The challenge for those in the world of offsite construction, where the pre-manufactured value of components and modules is much higher, is that traditional benefits of local job creation and local spend may seem harder to achieve.

But the process of offsite can and does create significant amounts of local value in the areas where factories are located, by supporting the growth of responsible and regional businesses. In addition, taking an offsite approach can provide significant local benefits through improved workplace wellbeing and air quality, and reduced carbon, nuisance and waste.

Fundamentally, it is this tension between local and national social value that leads to an assumption that offsite will deliver less social value. We explore these themes throughout this report and we hope that offsite companies will find the advice provided a step change in their approach to social value.

I'm delighted that we have developed this report in collaboration with Akerlof and University of Salford, two organisations with a detailed understanding of the worlds of both offsite and social value.

My call to the industry is to measure the social value you are creating methodically and use this evidence base to illustrate to clients the value you have brought to society. Our commitment to industry is that we will help you with the skills to do this.

Ian Heptonstall
Director, The Supply Chain Sustainability School

Objectives and scope

The aim of this guidance is two-fold:

1. To assess the ways in which an offsite approach can create value and, in doing this, break down the perception that social value and offsite are concepts at odds with one another.

2. To support offsite organisations in taking the first steps to embed social value, by understanding where to start.

The guide is centred on what we know now, best practice case studies and practical recommendations. It is applicable to projects using any offsite construction method which increases the premanufactured value of the asset, as well as any type of building, from homes to infrastructure. Though the principles can be widely applied, social value should always be context specific.

While we don't get into detail on the types of offsite or Modern Methods of Construction in this report, there is a nuance that should be noted. Many projects use a blend of offsite and traditional approaches, and even volumetric manufacturers retain some onsite trades. In essence this should mean that clients can dial up the benefits of offsite construction in the vast majority of cases. Improving data capture will help to tailor the approach for each project or programme.

Rationale and methodology

This report was developed at the request of the Supply Chain Sustainability School's Offsite Leadership Group. Supporting information has been kindly shared by the Offsite Leadership Group, Supply Chain Sustainability School partners and other industry organisations in workshops and interview settings. With the help of researchers at the University of Salford we have complemented these insights using wider published material and academic literature, although there is currently limited research specifically addressing social value and offsite.

Acknowledgements

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1. Introduction

What is social value?

Over the last decade, numerous definitions of social value have been developed. Each is different as they are developed to suit individual needs and perceptions, but definitions often have overlapping themes. Fundamentally, social value explores the impact of our activity on the people most impacted by that activity.

It is expected that social value or social impact is considered as part of the development, construction, and operation of built environment assets. The Social Value Act mandates the inclusion of social value in public procurement with the more recent Social Value Model, providing additional guidance and a minimum scoring threshold for central government procurement. Local authorities may seek to impose social value on private sector developers through planning and the commonly used Section 106 agreements. Some of the benefits requested through planning may not be additional, instead compensating for any negative impacts of the development such as pressure on local services.

Flexibility and additionality are key concepts:

Flexibility

Whatever definition for social value is selected, a degree of flexibility on the approach, areas of focus and measurement approach should be maintained to optimise impact. The approach to social value should always be context specific.

Additionality

Social value is premised on creating additional value over and above the inherent value created in the delivery of a built environment asset and accepted baselines for performance. As an example, we would hope that a new hospital would improve the health outcomes of patients. Additional value creation may include procuring responsible materials, educating and employing NEET(s) during manufacture, engaging with and upskilling VCSE(s), and focusing on the wellbeing of both your own staff and the building end users.

Environmental, Social and Governance (ESG)

There has been a significant rise in Environmental, Social and Governance (ESG) related investment, which is predicted to continue. The origins of ESG are centred on mitigating risk , while social value largely focuses on positive impact. This said, ESG frameworks are developing to encompass more and there is significant overlap between the topics. A sound approach to ESG is likely to create social value and conversely, a sound approach to social value will directly support the E, S and G.

'All public sector organisations and their suppliers must look beyond the financial cost of a contract to consider how the services they commission and procure can improve the economic, social and environmental wellbeing of an area.'
Public Services (Social Value) Act (2013)

'Social value has a lasting impact on individuals, communities and the environment. Government has a huge opportunity and responsibility to maximise benefits effectively and comprehensively through its commercial activity.'
Guide to using the social value model (2020)

'Social value is the value that people place on the changes they experience in their lives. Some, but not all of this value is captured in market prices.'
Social Value UK

Business Case for social value

- Improved talent pipeline and recruitment
- Staff wellbeing supports a productive and happy workforce
- Greater diversity improves workforce resilience
- Enhanced reputation and brand
- Access and win work
- Greater transparency of supply chain reduces risk
- Stronger stakeholder management

Combining social value and offsite

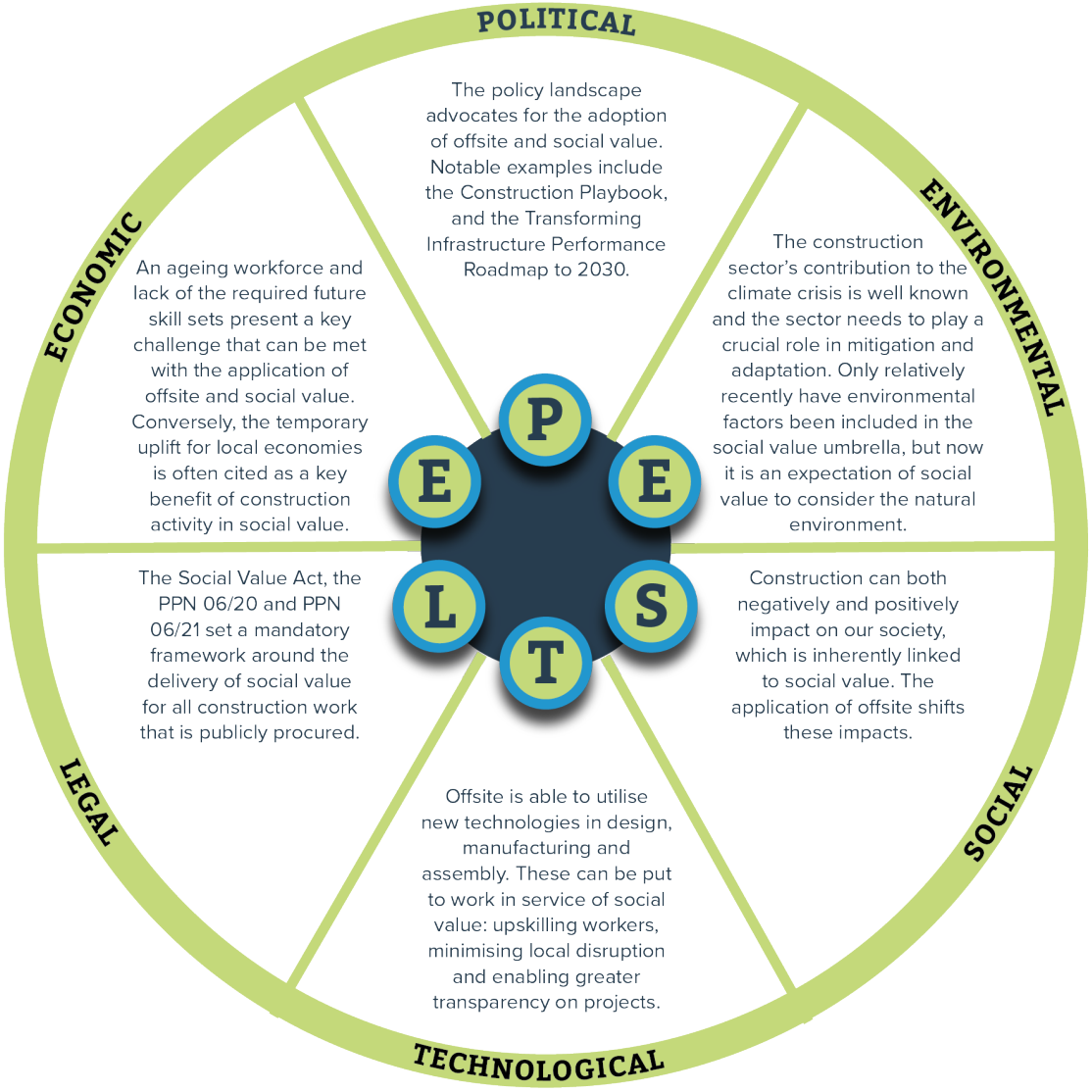
Social value and offsite construction are not new concepts - the drivers have been in place for many years, particularly in the form of central government policies, and offsite technologies are becoming well-established if not yet mainstream. Within the Construction Playbook, the Government explicitly puts social outcomes and the application of offsite side by side, on a comply or explain basis. As clients embed social value requirements in procurement and the private sector interest in ESG grows, it will be necessary for organisations in the offsite sector to deliver social value. At the SME end of the sector, organisations will need to respond to the social value requirements of others in the value chain, such as Tier One contractors and integrators.

Winning work is one reason to join the dots between offsite and social value, but certainly not the only reason. As an emerging sector, offsite has many new and growing organisations which could benefit from a sound approach to social value, to reduce risk, improve recruitment and enhance reputation.

Benefits of implementing a social value strategy

Through understanding and optimising the social value provided by their projects and operations, organisations can benefit in multiple ways, including:

- improving talent pipeline and recruitment
- supporting a productive and happy workforce by focusing on wellbeing
- improving workforce resilience and diversity
- enhancing reputation and brand
- accessing and winning more work
- Reducing risks through greater transparency of supply chain strengthening stakeholder management



2. Opportunities and tensions

As our approach to the delivery of construction projects evolves, it is critical that we understand the impact this has on what social value is created and how. By exploring opportunities and tensions, we can inform decision-making and set performance baselines, to help increase impact.

In reviewing the research available, and working in dialogue with the Offsite Leadership Group, we have identified the notable points of opportunity and tension associated with social value creation and offsite delivery. It should be noted that there are many areas, including SME spend, volunteering, and community partnership, where it is anticipated an offsite approach would generate a comparable level of social value to a traditional approach. We have not noted these in the table overleaf.

Our overarching finding is that there is a lack of available data to evidence the comparative social value created by offsite methods and to effectively establish baseline performance, in addition to drawing comparative conclusions against traditional construction. This is not necessarily surprising given the age and level of development of the sector, and there is great potential for building this evidence base through collaboration.

⊕ **Opportunity:** An area of social value (theme or outcome) where there is scope to create as much as, if not more social value than a traditional approach..

⊖ **Tension:** An area of social value (theme or outcome) where an offsite approach may result in less social value than a traditional approach.

Promote employment and skills

- ⊕ Stability & long-term retention of employees
- ⊕ Good working conditions, safety, staff wellbeing and mental health
- ⊕ Accessibility, diversity and inclusion- the proportion of women and ethnic minorities employed
- ⊕ Local (to offsite location) employment opportunities
- ⊕ Upskilling opportunities for those under-represented in the sector or disadvantaged
- ⊕ Development of existing workers and supply chain through CPD
- ⊕ More employment opportunities for disadvantaged people- NEETs, long-term unemployed, service leavers, homeless, and ex-offenders
- ⊖ Job opportunities not necessarily local to the development site
- ⊖ Upskilling opportunities for employees & the wider community may not be local to the site

Supporting the growth of responsible and regional business

- ⊕ Greater transparency in the supply chain, to support responsible procurement & shared social outcomes
- ⊕ Tackling regional inequalities, by driving spend to communities most in need
- ⊕ Productivity in the sector
- ⊖ Spend may not be local to site

Healthier, safer and more resilient communities

- ⊕ Initiatives to support temporary housing to tackle homelessness
- ⊕ Empowerment, customisation, and transparency
- ⊕ Sustained community partnerships, with focus such as digital inclusion
- ⊕ Speed of delivery - ensures the community can benefit from the asset and onsite disruption is minimised
- ⊖ Larger vehicles may cause greater short-term community disruption

Decarbonising and safeguarding the planet

- ⊕ Life cycle carbon - including saving in emissions on the contract. Reduced embodied carbon. Scope 1/2/3 emissions disclosure.
- ⊕ Resource efficiency - Reduction in energy use during construction. Logistics/fleet miles saved during the contract. Reduction in use of plastics, water and waste.
- ⊕ Resilience to environmental change

Promoting social innovation

- ⊕ Innovative measures to promote skills or innovative measures to safeguard the environment

As an emerging area of practice we have not included a section on innovation, and will look to cover this in detail in future reports.

Social value opportunities which could be enhanced by offsite construction and possible tensions specific to offsite. These are aligned to the National Themes, Outcomes and Measures (TOMs) framework (Social Value Portal) and are expanded upon in section 3

3. How can offsite deliver social value?

Promote employment

Offsite construction brings about a new way of working in the sector, with increased jobs in factory settings and onsite assembly work in contrast to the multiple trades of traditional construction. These working environments can improve job security and safety, with knock-on effects for wellbeing, accessibility, and inclusion.

Job satisfaction, working conditions and wellbeing

The construction sector has a relatively precarious workforce, with over 35% of workers being self-employed, the highest of any sector in the UK economy (ONS, 2021).

Construction is also a particularly dangerous sector with a fatal injury rate approximately four times the average of industry in the UK. Offsite construction is considered to provide a working environment with less risk (HSE, 2009), in part due to reductions in working at height and exposure to bad weather. Using the manufacturing sector as an analogue, fatal injuries could be reduced by 40% and non-fatal by 42% by moving construction offsite (Akerlof, 2022).

Whilst good health and safety is considered a baseline and therefore not additional in social value terms, a safe working environment is a key marker of health and wellbeing in the workplace, so should be seen as a foundation for good social value. When combined with more secure, permanent work contracts this provides a high quality employment offering for local communities.

That greater job satisfaction can come about through the more stable nature of factory-based work is a commonly heard assertion. However, evidence for this appears to be only anecdotal at present and further data, such as employee turnover or length of service figures and employee wellbeing surveys are needed. Similarly, direct evidence for improved outcomes for health, safety and wellbeing e.g. reduced or eliminated health and safety incidents or measured improvements in employee wellbeing over time in offsite construction settings was not found in the process of conducting this report and should be collected and reported by organisations.

Accessibility, diversity and inclusion

There is an expectation that the move to factory-based working environments will improve access for underrepresented groups in the construction sector, particularly women and people with disabilities. This is due to the job stability and certainty of location, the greater ease with which health and safety provisions can be made and protection from the elements within factories.

Recent data from the Labour Force Survey showed that women are still significantly under-represented in construction, and low percentages continue to be recorded for people from ethnic minorities and with disabilities (CITB, 2022). Other scientific, technical and engineering industries have a higher percentage of female employees, for example, with 12% in construction compared to 25% in manufacturing in 2017 (Innovare Systems, 2019).

Again, despite a compelling theoretical case for the offsite working environment being more attractive to a diverse range of people, there is limited evidence that accessibility or diversity is better within offsite manufacturing facilities or on projects utilising offsite construction methods. We expect this to improve in the short term however, with some manufacturers indicating they were in the process of collecting data.

Local employment opportunities

The most commonly perceived drawback of offsite construction with regards to social value is the difficulty in achieving the quantity of job creation local to the development site compared to traditional construction. This is often driven by client requirements stipulating social value outcomes to be within a set proximity of the site or city (Watts and Higham, 2022), especially in the case of local planning authorities wishing to capture value within a specific geographical area.

However, offsite construction offers new job roles both at the site of manufacture and at the project site, including in digital design, multi-operative roles, logistics and assembly (CITB, 2017). Depending on the design, jobs requiring less formal training can be created local to the site, empowering community builds or bringing new entrants into the sector. The sustained presence of manufacturing facilities also allows long-term engagement with education providers, creating opportunities for work experience. Regular apprenticeships are also offered for onsite and offsite roles.

Offsite also does not negate the need for traditional trades. As an example, during the 'Enabling Housing Innovation for Inclusive Growth' programme SNUG Homes found suitable roles for trainees, residents, local subcontractors and the core team through trialling and refining allocation of construction tasks (BCC, 2021).

With an ever-increasing labour shortage in the industry (IPPR, 2021), creating attractive, stable jobs which bring in new people should be a primary focus. Offsite construction can arguably provide more attractive work environments and training opportunities for young entrants.

Actions for offsite organisations

- Provide stability and role security, with permanent contracting where possible
- Proactively remove barriers and create routes through which people can enter the sector. For example, ensure recruitment practices are open and accessible, and all reasonable adjustments are considered
- Implement employee wellbeing surveys and strategies to increase and enhance wellbeing
- Measure the diversity and location of your staff annually, compare these to ONS data
- Measure your health and safety performance and compare these to HSE data for construction site work
- Use existing data sets to set baseline for staff turnover, then create a staff survey to assess areas of improvement. Repeat annually, to check for improvement

Case Study: TopHat
Driving up diversity and inclusion

How do we ensure our team reflects the community in which we work?

Attracting and retaining a diverse workforce is important to TopHat. It is seen as an indicator of fair hiring practices and good workplace culture. In terms of benefits, the ability to attract a broad workforce is known to enable diversity of thought, creative problem solving and reduced vulnerability to employment or skills shortages.

At the manufacturing site in Derbyshire proactive efforts have been made to create an inclusive community through flexible shift patterns, signage in multiple languages, inclusive onboarding, and active celebration of diversity. Members of staff include military leavers, prison leavers and people from all over the world. TopHat is also actively reducing employment barriers for those with disabilities and has recruited two hearing-impaired apprentices.

TopHat nurtures talent through training programmes and clear routes to progression. There are team members that have progressed from joiner to technical lead in only a few years. The senior leadership team actively support women in leadership, both internally and with cross-sector initiatives. To support the next generation of talent, TopHat is building a partnership with the Bedford College Group.

318 people employed at TopHat

19.7% of the workforce is female, higher than the average for construction

Average age 37.5

"We want to employ and grow the best talent within TopHat, to do that we have to create an inclusive workplace."

Andrew Shepherd,
Managing Director, TopHat Communities

Promote skills

Development of existing workers

Longer-term employment can enable more opportunities for development and training for employees to build expertise across a range of skills. The organisations we interviewed in the offsite sector had taken steps to embed both formal and informal training structures to upskill staff, with many identifying clear progression routes. New roles, for example in digital engineering or onsite assembly, such as Laing O'Rourke's Construction Assembly Technician, can offer attractive opportunities for retraining as well as new entrants.

Bringing in new workers

Pre-fabrication can simplify the onsite assembly of buildings, enabling participation from a broader range of people than traditional construction. This different skills requirement could provide one solution for the construction industry's labour shortage as well as bringing benefits to the local community and underrepresented groups.

Osco Homes, Agile Homes and TopHat are all working to provide stable employment for those leaving prison in their offsite factories, in efforts to reduce reoffending rates. Throughout the interviews conducted, the scope to upskill those further from employment was repeatedly noted, including people leaving the military, reskilling from declining manufacturing sectors, or at risk of offending or reoffending. Small projects geared towards local community involvement have also demonstrated the accessibility of the sector.

CITB noted the need for offsite skills training to be delivered at scale, which provides an opportunity for the offsite sector to provide training in offsite skills to those in need of employment and create social value (CITB, 2017).

Actions for offsite organisations

- Collect data on the backgrounds of new recruits – how many are from hard to reach communities such as ex-offenders, ex-military or long term unemployed
- Ensure there are clear training pathways for every member of staff
- Seek opportunities to share training opportunities with supply chain partners
- Establish partnerships (e.g. with job centres, charities and social enterprises) to deliver upskilling to those in need of employment
- Record all training and upskilling activities
- Identify opportunities for informal training, like toolbox talks

Case Study: Studio Bark

No Building As Usual

In order to halt global warming, we have to stop building as usual.

Despite the climate emergency being the defining challenge of our time, 77% of architecture students feel that their courses aren't properly preparing them (ACAN, 2021). Moreover, data has revealed the significant lack of diversity in the sector. Currently only 28% of qualified architects are women (ARB, 2019) and only 1% are black (ARB, 2020). This is reflected in education, where only 12.1% of total students passing their Part III are from ethnic minority backgrounds (RIBA, 2019).

No Building As Usual is a pioneering educational build programme conceived to address these issues. Bringing together a group of 12 students, where 83% were women and 70% were non-white, the programme provided a space which broke from industry norms. This included mentoring sessions and workshops on topics ranging from sustainability to equality, diversity & inclusion.

The test bed for the 10-week programme was Nest House, an accessible, single storey eco-home in rural Herefordshire constructed wholly of Studio Bark's modular U-Build system. This self-build system is designed using circular principles and biogenic materials to reduce embodied and whole life carbon.

The completion of Nest House through NBAU demonstrates the possibility of delivering a radically low carbon building while simultaneously creating educational opportunities and responding to social problems.

Embodied Carbon: 215 $kgCO_2/m^2$, which is less than half of LETI's Climate Emergency Design Guide's benchmark of being below 500 $kgCO_2/m^2$

92.5% of students felt that their knowledge of 'carbon literacy' has improved greatly

78.8 % of students felt that their knowledge of working with individuals of different backgrounds and ethnicities has improved greatly

"[NBAU] has affected what I think architecture is and what role I want to play"

Gracious Muzamhindo
NBAU 2021 Student Participant

Supporting the growth of responsible and regional business

This theme discusses wider benefits to local and regional economies that can be brought about through offsite construction.

Tackling regional inequalities

The offsite construction model brings about flexibility in the location of production and therefore job creation. In this way, offsite manufacturing has the potential to help re-distribute the economic value of developments to communities most in need of economic uplift. This is particularly important in the context of long-standing regional inequalities that exist in the UK (IPPR, 2019). Factories can be located permanently in areas with histories of manufacturing, bringing long-term jobs to where they are needed and where skills already exist. The establishment of facilities can also provide a more widespread economic uplift as local supply chains are developed. This can encourage innovation, as well as provide the opportunity for partnerships which have a knock-on effect on other areas of social value, such as circular economy models.

In scenarios where the greatest social value benefits would come from production more local to site, the flexibility offered by offsite can also provide this. During research and interviews, a number of organisations expressed their ability to move manufacturing locations depending on the scenario. ZED PODS, for example, is able to use factories located close to the site due to the factory-agnostic model used. Use of 'pop-up' or 'flying' factories has also been used in infrastructure contexts such as airports and rail extension projects, providing final stage assembly jobs local to site in addition to regional manufacturing roles.In the future, offsite manufacturing hubs could be distributed across the country, with local authorities deciding where they can provide optimal social value.

Productivity in the sector

The potential for offsite construction to break through construction's stagnation in productivity was expressed in the Farmer Review (CLC, 2016) and has been a key driver behind the encouragement of offsite construction by the UK Government (Cabinet Office, 2020). There are a number of ways offsite construction can improve productivity, such as consolidating demand for similar products, increasing the speed at which buildings can be built, and continually improving processes (Zolghadr et al., 2022). Digitisation and standardisation are thought to result in fewer defects and optimised performance in the end product.

In particular, build speed is a clear advantage of offsite construction. Reductions in programme time can range from 15 to 50% (Smith, 2016; MBI, 2019), with knock-on effects for local disruption as discussed in section 3.4.

Actions for offsite organisations

- Assess local need when responding to tender requirements, the indices of multiple deprivation can be a helpful starting point.
- Capture productivity data to show year on year trends and to compare offsite solutions with traditional builds
- Understand the economic impact created by activity. You may choose to monetise this impact and use a local economic multiplier, such as LM3
- Recognise clients may mandate a balance in economic impact local to the onsite and offsite location; take time to understand the best mechanism to support this, it could be onsite assembly, reserved onsite trades (such as roofing) or upskilling local tradespeople for the operation of the asset
- Note to clients: Offsite delivery can significantly reduce construction programmes, which may have an attributable societal value. As an example, there is both social and economic value created in moving people into stable, affordable homes. When considering the application offsite, balance both immediate and whole life social value

Case Study: Laing O'Rourke
Explore Manufacturing Ltd

Engagement with future talent pipeline – securing a skilled local workforce for the future

Laing O'Rourke's Centre of Excellence for Modern Construction (CEMC) was opened in 2009 and is located in Worksop, North Nottinghamshire. At the time of the planning application, the 2001 census indicated that in the study area of Bolsover and Bassetlaw 64% of the population were economically active (NOMIS, 2008).

Since the opening of the facility, Laing O'Rourke has offered numerous jobs and a diverse range of roles to the local area, currently directly employing 319 staff. Most of Laing O'Rourke's construction projects are in London and the South, with the facility demonstrating how opportunity and prosperity can be provided to other regions of the country.

The facility has been able to offer a sustainable source of employment for the local area. Being a local employer has enabled the facility to engage with local schools and participate in career fairs to attract local talent and offer apprenticeship schemes.

Working with Laing O'Rourke's Early Talent Team, CEMC has led a trailblazer group that developed a new apprenticeship standard for Construction Assembly and Installation Operative. This will support the transition to Modern Methods of Construction across the industry and will be used to upskill existing members of our project teams and train new entrant apprentices recruited across the country.

CEMC has 14 live apprenticeship opportunities with roles varying from steel fixers to data technicians and analysts, civil engineers and business administrators, representing £21,308.28 in delivered social impact through tackling economic inequality (Impact Evaluation Standard)

Latest workforce reports from August 2022 show that 90% of CEMC's workforce are local to the area and live within 30 miles of the facility. 77.35% of the workforce live within 15 miles of the facility.

"a massive thank you for this morning's presentation and input. The students were really engaged in the presentation"

Kerry Smith
Design Technology Outwood Valley Academy

Healthier, safer and more resilient communities

Offsite construction can generate social value to the communities near to the development site as well as the offsite location.

Empowerment, customisation and transparency

Particularly in the homes sector, design for manufacture and assembly (DfMA) can open doors to more meaningful participation in projects for stakeholders. Digital designs can be more easily manipulated and customised, and components can be designed for simple assembly on site for community builders who lack specialist construction skills. This engagement can provide long-lasting value to the owners, users or occupants of the buildings.

Even with complex buildings where participation is limited or not appropriate, clients and the local community can have enhanced transparency over the development process by taking advantage of digital tools. The 'We Can Make' project in Bristol demonstrated some of these possibilities by creating a digital platform which could be used by local people to manage the design and fabrication process of new homes (BCC, 2021).

On site disruption and pollution

An obvious social value benefit brought about by the quicker build speeds, fewer material and vehicle movements, and reduced personnel traffic of offsite developments is the associated drop in pollution, noise and disruption for local residents. For example, a reduction in vehicle traffic of as much as 40% has been reported from projects with fully fitted out modules (HSE, 2009). A reduction of CO_2 emissions related to site-based transport of 60% was found in a comparative study between modular and conventional buildings (Quale et al., 2012). It would be reasonable to draw conclusions that air pollution and traffic disruption were also significantly reduced.

Actions for offsite organisations

- Track the reduction in build programme time, vehicle movements, noise and vehicle emissions and pollution against established industry benchmarks for traditional construction. Compare across MMC category types and locations
- Be clear in communicating the benefits of the offsite approach to the local community
- Carefully consider the impact of logistics on the local community, programming deliveries to minimise impact to the community local to the site
- Exploit the benefits of digital design processes, to support and structure stakeholder engagement
- Conduct a full stakeholder map for any new project so that all those positively impacted by the Offsite approach can be identified and appropriate data collection points set and metrics agreed
- Take time to understand local, regional and national needs of any new project which may extend beyond a simple 'local' focus for supply chain spend, so that innovative ways of supporting local communities can be achieved

Case Study: ZED PODS 'Hope Rise'

Affordable, zero-carbon homes built above a public car park

Benefits to the local community and supply chain brought about by zero-carbon modular homes project

This project aimed to address the need for good-quality, affordable homes with good infrastructure support for young homeless adults and those at risk of homelessness. It had to retain 100% car parking spaces and comply with the sustainability objectives of Bristol City Council. A key challenge was the lack of knowledge of MMC amongst stakeholders.

Eleven new modular Council homes were built to house young vulnerable adults. A team of four live-in 'community builders' were recruited to live alongside and help build a social support network amongst the residents. The homes are highly energy-efficient and zero-carbon in operation, and the car park was upgraded with EV charging points. Local companies were hired to deliver the groundworks.

ZED PODS' innovative design and offsite construction process resulted in good-quality, social-rent homes in a difficult-to-build site. The build time was 50% quicker than traditional construction at the same cost, and the homes are 1/3 cheaper to rent. 104% of the energy is generated onsite by solar panels, and the peer-support network helped tenants move into work and education. In addition, more local supply chain organisations have started to work with ZED PODS on other projects.

At time of moving in, 4 out of a total of 9 residents were not in education, employment or training (NEET), 4 were working, and one was in college. After a year staying at ZED PODS' "Hope Rise", 6 were working, one was in an apprenticeship, one was in college and one was NEET.

More information can be found in the post occupancy study.

"This place has done such a good job of making me feel you have support around you. Sometimes there's an activity or sometimes its food nights. The people here are so nice, you feel like you are being welcomed with open arms every time they see you. Each person I've met has helped me come out of my shell a little bit more."

HR resident

Decarbonising and safeguarding the planet

Reducing the negative impacts of development on the environment is a key priority as the sector works to meet its responsibilities for decarbonisation. Whilst reporting for environmental performance on projects is commonplace, relating the data to social impact and outcomes is not. Historically, the social value proxy values for environmental outcomes have been low relative to employment measures, but this is an issue all the measurement frameworks are actively working to address.

Life cycle carbon

Offsite construction is a promising enabler for reducing the carbon footprint of the built environment. Embodied carbon can be reduced by improving efficiencies and reducing waste in the factory, utilising low-carbon materials such as timber and alternative cements, reducing vehicle movements in logistics, and minimising fuel use, energy use and working hours on site. For example, a recent analysis found that the upfront embodied carbon of a modular timber home was 30% less than a traditional brick and block home (CPPLC, 2021). A similar reduction was also achieved at commercial development The Forge, and two volumetric residential developments recently recorded savings of 41% and 45% (Ten Degrees, The Valentine; Association for Consultancy and Engineering, 2022). It's important to note however that these are examples, and no overall assessments have yet been made across MMC categories or building types.

In a typical onsite assembly environment, fewer people will be working for less time overall. This brings inevitable reductions in the use of energy, lighting and equipment. Even when combined with the energy use in the factory attributed to the project, 30% savings have been recorded compared to conventional builds (Quale et al., 2012).

In terms of energy efficiency, a building constructed offsite would be expected to have greater air tightness, and mechanical and electrical systems installed in the factory should perform closer to specification. A survey of educational buildings found a 26% improvement in actual energy performance compared to typical ratings for the building type (Buildoffsite, 2013).

Digital design tools can be utilised by the offsite sector tied to an effective stakeholder engagement strategy to co-design low carbon, energy efficient buildings with communities. Recently there have been a number of offsite developments achieving a net-zero in operation classification (ZEDPODS Hope Rise; The Forge), and the modular homes provider TopHat estimates that the lifetime emissions of its homes will not reach the level of embodied carbon produced by a traditional home.

There is a lack of real measured performance data for residential and commercial buildings which needs to be addressed to demonstrate the ability of offsite construction to overcome the performance gap.

In order to demonstrate social value additionality for life cycle carbon benefits, emissions reductions, energy efficiency improvements and should be recorded against an acceptable, agreed baseline such as the Real Estate Environmental Benchmark (REEB; Better Buildings Partnership 2021).

Resource efficiency

Designing for manufacture should reduce the amount of waste produced compared to conventional building practices. Materials quantities can be ordered more accurately, waste materials can be sorted more easily, and potentially even reused within the facility. Manufacturing is much less wasteful than construction, with waste making up 1-3% of raw material tonnages vs construction's 10% average (Buildoffsite, 2013). Through repetition, processes can be optimised to reduce waste and systems can be put in place to track materials and components.

On site, the benefits can be even more pronounced, with reports indicating volumetric systems can achieve up to a 90% reduction in waste (WRAP, date unknown). Other studies specifically looking at waste arising from timber formwork and concrete works found reductions of 74-87% and 51-60% respectively (Buildoffsite, 2013).

On a project scale, there are plenty of examples of prefabricated buildings which have been deconstructed and reassembled at new locations, minimising demolition waste. Recent examples of design for deconstruction are TEDI London, which has fully reusable components (Hawkins\Brown), and UBuild's Boar Lane Studios which was dismantled and reused as office fit-out in another location. Classrooms, hospital facilities and project accommodation are other examples of frequently reconfigured and reused modular buildings. In terms of materials, more research is needed on the recycling and reuse potential of commonly used composites such as OSB and Glulam (GCB, 2020).

Resilience

Momentum is growing around the topic of resilience, and while not explicitly included in social value at this point, it is certainly an area to watch. Improving the resilience of structures and buildings should be considered an important aspect of social value, particularly in the context of environmental change. A recent joint report from Buildoffsite and CIRIA (2022) discusses multiple innovations which can extend the life of precast concrete structures, as well as reduce and protect their embodied carbon. For example, repairs which integrated structural health monitoring and cathodic protection systems on the Woodhouse Inn Viaduct performed well over 20 years, with no need for further repair since installation. Designing in measures such as these from the outset would be far preferable and made much easier in a factory setting.

Actions for offsite organisations

- Measure your carbon footprint and apportion this by projects
- Understand the embodied carbon of the most impactful materials you buy, such as steel, concrete and glass
- Understand the operational performance of your products and collect data to evidence energy performance and compare this to the designed energy use
- Collect data on waste, to include total volumes and how much is re-used, recycled and sent to landfill
- Explore routes to improve environmental impact, with changes to products or processes

Case Study: Bryden Wood

The Forge (Landsec, Bryden Wood, Easi-Space)

PDfMA delivers efficient and effective sustainable and net zero carbon design and construction

Landsec set out to build better, faster, safer, greener and more cost effectively. So they adopted Bryden Wood's Platforms approach to Design for Manufacture and Assembly (PDfMA), with initial funding support from UKRI. This approach embodies the IPA's vision outlined in their 2018 and 2021 Transforming Infrastructure Performance reports and is described in detail here.

The lean design of the substructure reduced both material quantities and the extent of excavation works, reducing its embodied carbon by 17%. Embodied carbon was further reduced in the concrete mix, through a combination of lean design and 50% ground granulated blast furnace slag (GGBS) content.

The superstructure steel frame and beam casing, integrated closely with MEP, reduced the overall building volume, substantially reduced material and weight and reduced operational carbon.

The PDfMA approach combines with other techniques to reduce energy demand, ensure resilience in a global warming scenario and ultimately allows for net zero in operation.

The UK's first commercial building to comply with the UKGBC's framework definition of a net zero carbon building, in both construction and operation.

Overall reduction of 30% in embodied carbon overall, 40% in substructure, 22% in the superstructure and façade, 46% in steel, 13% in concrete

NABERS UK 5* rated

"You have one of the UK's largest companies, working with one of the UK's smallest companies, with one of its most innovative design organisations, that have come together to produce something, we hope, that will start to change the way buildings are designed, delivered and constructed."

Neil Pennell
Head of Design Innovation and Property Solutions, Landsec

4. Optimising social value: key steps

There are key steps that the offsite sector can take to embed good social value practice that will help to optimise the opportunities and minimise the tensions associated with an offsite approach.

	OFFSITE SECTOR BODIES	ORGANISATION	PROJECT
UNDERSTAND YOUR POTENTIAL	Develop a clear narrative to illustrate the social value created by offsite.	Be clear on how your organisation creates social value, and what 'local' means in the context of your organisation.	Understand the priority areas of social impact for the project.
UNDERSTAND THE CONTEXT & PRIORITISE	Provide context on emerging social value priorities and the interface with an offsite approach.	Understand local needs (local- defined as local to the business and local to the site) and prioritise areas of focus. If you are considering where to locate an offsite facility a full assessment of the needs of the local community will inform the approach and support planning or dialogue with local stakeholders.	Understand local needs, local to site, but also take account of offsite social impact.
INVOLVE STAKEHOLDERS	Map and help national and regional stakeholders to understand the opportunities & tensions presented by an offsite approach.	Build sustainable relationships and collaborative ways of working within the community of operation. This applies whether defining social value creation for a project or developing a strategy for your organisation.	Map and engage early with all key local stakeholders to explore opportunities and tensions.
IDENTIFY OUTCOMES	Set some common definitions, outcomes and measures that can be applied across the sector. Provide guidance on appropriate reporting frameworks.	Shape target outcomes around the areas identified as creating the greatest value, feeding in stakeholder priorities. Communicate the value the organisation adds clearly and concisely.	Develop a project-specific plan which targets meaningful outcomes, supports and makes the most of the local context.

	OFFSITE SECTOR BODIES	ORGANISATION	PROJECT
DESIGN IN SOCIAL VALUE[1]	Communicate successes and failures in designing-in social value through case studies.	Allow space in the design process to design for embedded and inherent social value.	The design freeze will need to be agreed upon earlier with an offsite solution, which means extensive, early stakeholder engagement will need to take place to capture and embed key outcomes.
ROLES, RESOURCE & RESPONSIBILITIES	Help the sector to identify what roles and resources are needed to deliver value for the sector.	Take time to prioritise the key outcomes you want to deliver and allocate appropriate resources (such as people and money) to ensure social value can be optimised.	Allocate resources to ensure the project can deliver outcomes and social impact.
COLLABORATE	Establish partnership working across the offsite leadership groups in the sector to improve social value approaches.	Work in partnership with other suppliers, VCSEs, clients, local authorities and the sector to drive good practice.	Work with the client to understand what can be achieved and what cannot, to set a realistic and proportionate approach. Work with established local partners to deliver greater social value.
CREATE A ROADMAP	Set milestones to help the sector increase its social value maturity.	Set clear milestones to drive an improvement in social value, share internally and with key stakeholders to increase visibility and ownership.	Set clear milestones to maintain focus and share with project stakeholders to increase visibility and share responsibility.
MEASURE IMPACT, MONITOR & SHARE	Using quantitative and qualitative processes, capture social impact best practices and share this. Ensure access to measurement guidance is readily available.	Using quantitative and qualitative processes, capture impact and share. Report the social value created accurately and transparently, sharing the methodology.	Establish robust reporting methods, report regularly, share good news and learn from challenges. Be clear on who has responsibility for collecting specific data sets to avoid duplication of effort.
INNOVATE TO ADD VALUE	Capture and communicate innovative social value practices to encourage innovation.	Use the baseline you have collected to drive continuous improvement and encourage innovation within the organisation, e.g. incorporating low carbon materials into products and platforms.	There are some communities that need a considerable local economic boost, from employment to skills and spend. Where this is the case, you may need to be creative in your approach to social value . Think about local material hubs, skills hubs for onsite trades and using locally sourced logistics.

1 - Designing Social Value (2021) explains how architects and designers can work to maximise SV at each stage of the RIBA Plan of Work.

5. Measuring social value

There are commonly noted challenges when it comes to measuring social value. These include a lack standardisation in approach, misalignment in expectations across the value chain and risk of impact washing. While there is no solid formula for mitigating these challenges, some of the principles below will be useful in establishing a well-structured approach to measurement.

Key principles

Focus on the quality of measurement, not the quantity

Starting to measure social value can be an overwhelming process as there are hundreds of measures that can be applied. Once you've identified the areas where the greatest impact can be made, structure your approach to measurement around these areas.

Make use of the data you have

Through the workshops, attendees asked if investing in a platform that forecasts and measures social value using monetised proxy values was critical. Keep in mind that the underlying data sets will need to be collected with or without a social value platform, so focus on this first. As an example, your diversity, recruitment, and supply chain spend may all sit within an ERP system and if so, you need to find a way to pull, aggregate and interrogate this data.

If you choose to use an existing platform or tool, our recent Social Value Tools Report (SCSS, 2022) details the available options.

Be transparent and robust

If monetising social value, it is critical to use a robust and accepted methodology to calculate the social value, factoring in additionality. Be transparent in the methodology used and, if possible, have the figures reviewed by a third party.

Learn and improve

The core reason for measuring social value is to take insights from the data, then continually improve the approach and underpin decision-making for future projects.

Quantitative vs qualitative

Balance the collection of both qualitative and quantitative data. The case studies and stories will bring the quantitative data to life and demonstrate impact.

Understand inputs, outputs, outcomes and impacts

Social value can be measured by recording inputs, outputs, outcomes and/or impacts. Using the example of career support, the input would be the number of volunteer hours provided to young people for support; the output would be the number of young people experiencing the support; the outcome would be changes in the confidence of a young person; and the impact would be a resultant change in career path. Reporting impacts is the most meaningful, but this is not always possible. In communicating the social value created, be transparent about the metrics you are using.

Social value measurement and reporting for offsite

The principles identified above are good practices for any organisation considering the measurement of social value. There are a few concepts organisations should be particularly mindful of when measuring the social value of offsite:

Allocation of value

In measuring social value for a specific project, be careful only to report a true allocation value for the project. As an example, if measuring training hours in relation to an apprentice in an offsite location who works across multiple projects, agree a methodology with the client to assess the social value. At the simplest level, this may be agreeing to a proportion of time for the duration of the contract, but other clients may request that timesheets or biometrics are used to track hours.

Definition of local

Some clients will allow offsite providers to report local impact as local both to the development site and the offsite location, which means a much greater level of data can be captured. It is important that this is clarified upfront.

An evolving approach to measurement

The approach to social value measurement is continually evolving. As an example, the 2022 TOMs framework has significantly improved both the measures and proxies associated with environmental impact. Steps like this help in demonstrating the true social value created by offsite. In the same way that economic multipliers are added to local impact measures, some social value platforms are exploring the impact of spend in communities with greater economic need. Again, this will support the offsite market in demonstrating the true social value created. Every tool has its strengths and limitations and the first step should always be measuring inputs, outputs and outcomes for your organisation. A full breakdown of the social value tools and frameworks can be found in the Social Value Tools Report (SCSS, 2022).

6. Conclusions and recommendations

The perspectives brought by the Offsite Leadership Group and the Partners interviewed have demonstrated that social value is considered important by the offsite sector, but measurement and communication is at an earlier stage of maturity than the sector's traditional counterpart.

There are key areas of focus where the offsite sector has great potential to create as much, if not more, social value than a traditional approach. There is clear evidence this can be the case with regards to reducing embodied carbon, reduced community disruption and productivity, greater resource efficiency, and engaging communities and underrepresented groups in the construction process.

Areas in which there are compelling reasons offsite could excel, include improvements in working conditions and job satisfaction, diversity and inclusion, tackling regional inequalities, skills development, minimising local disruption and pollution and tackling the energy performance gap in buildings. However, there are a lack of comparative data sets to back up these inferences. Ongoing improvements in social value data collection will be critical to creating baselines, which will inform comparative assessments of differing approaches to delivery and drive continual improvement.

With growing data availability and research, it may become possible to compare the social value strengths and weaknesses of the various categories of offsite construction. This data will enable clients to more effectively and efficiently design an offsite strategy that will meet the required social value outcomes.

In summary, to strengthen the sector's understanding of its social value potential and improve the impact of organisations and projects, we recommend that offsite organisations:

- Record data on activities and social value metrics, including carbon, waste, diversity, job satisfaction, health and safety data for offsite and onsite locations and apportion to projects
- Compare to similar projects using traditional construction methods, analogous sectors, and against own KPIs
- Look for opportunities to improve from this baseline, share data, and communicate challenges and solutions through case studies
- Make the most of the collaborative nature of DfMA, using digital tools to embed social value into the design and improve engagement and transparency for stakeholders
- Think about both long-term and short-term social value, and
- Discuss and set definitions of 'local' early in the project, recognising impact beyond the development site

There is a role for the sector bodies in:

- Encouraging the collection of data and aggregation of insights as part of strengthening the case for offsite
- Considering if engagement with policy-makers is necessary to address the local to-site focus of social value

There is also an important role for the academic community to continue to work with industry organisations on measurement of metrics tied to the social value themes, collating data to provide an overarching picture of the opportunities by offsite, and on producing comparative studies.

With the scale of opportunity presented by offsite construction for enhanced social value, the Supply Chain Sustainability School commits to continuing to work with sector stakeholders to support measurement and communication of social value.

We would like to invite organisations working in this space to reach out to the School if they are interested in helping to build this body of evidence, and a baseline for comparative assessment.

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