IEMA Webinar:

Case study of Nuclear Power using IA, EM and Auditing

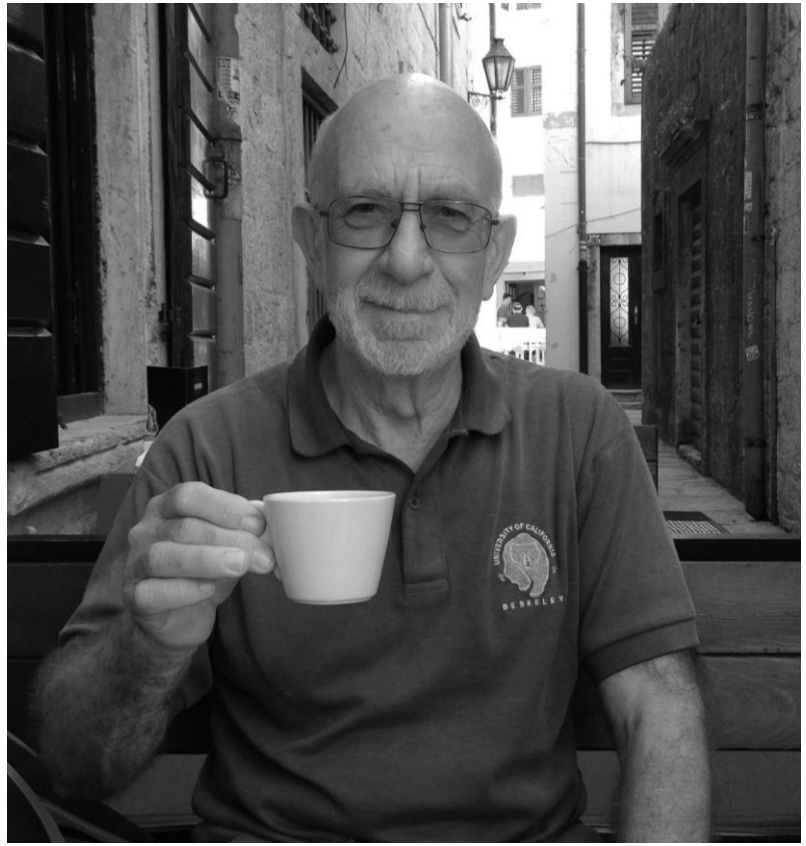
08 09 2020

Prof. John Glasson (Oxford Brookes)
Dr Rufus Howard (IEMA)

IEMA Transforming the world to sustainability

Prof. John Glasson

Professor Emeritus Oxford Brookes University; Founding Director of Oxford Institute for Sustainable Development; Examining Inspector, National Infrastructure, Planning Inspectorate



Dr Rufus Howard

Impact Assessment Policy Lead at IEMA

IEMA Transforming the world to sustainability

Webinar slides and recording

This webinar is being recorded. The recording and presentations will be made available for IEMA members on iema.net within 48 hours of the webinar.

IEMA Transforming the world to sustainability

Q&A

Send in your questions as we go through the session – we'll have plenty of time with our speakers after the presentation.

Presentation

Monitoring and auditing the environmental and socio-economic impacts of constructing Hinkley Point C nuclear power station

A Study for the New Nuclear Local Government Authorities Group (NNLAG)

Webinar Presentation for IEMA

by Prof. John Glasson

Impact Assessment Unit (IAU), Oxford Brookes University

8 September 2020

Presenter: John Glasson

- Professor, Oxford Brookes University; Planning and Impact Assessment Consultant; Examining Inspector, National Infrastructure, Planning Inspectorate (PINS).
- Extensive research experience on UK nuclear power projects, dating back to CEGB days, including 7-year monitoring study of construction of Sizewell B. Consultancy work on potential NNB for HPC, SZC, Dungeness and Bradwell, and on decommissioning of UK stations - recently for Canadian Nuclear Labs for Rolphton Nuclear Facility.
- Also currently working on socio-economic impacts of major N. Sea Offshore Wind Farm projects.
- Published widely on EIA, including Glasson and Therivel (2019), *Introduction to EIA: 5th Edition,* Routledge.

Structure of presentation

1. Research aims
2. Research approach
3. Overall findings
4. Some more detailed sector studies
5. Explanation of findings
6. Learning from other projects
7. Interim recommendations – generic and for HPC

1. Research aims

What? Research aims to:

- understand and document actual impacts of NNB in the community and on the environment, using early construction years of HPC
- focus on how actual impacts compare with predictions as part of the Environmental Statement (ES) and Development Consent Order (DCO) process
- explain unforeseen events and how they can be managed, with recommendations on better planning and assessment processes for future projects

(moving actual impacts evidence on from IAU Sizewell B Monitoring Study of 1995)

Who ?

- *supported by the New Nuclear Local Authorities Group (NNLAG)*
- *research team: Impact Assessment Unit (IAU), Oxford Brookes University*

Sponsored by New Nuclear Local Authorities Group (NNLAG)

- *NNLAG is a Local Government Association (LGA) Special Interest Group, consisting of fifteen Local Authorities that already host or are likely to host NNB projects.*
- *NNLAG's purpose is to share knowledge, information and best practice regarding new nuclear, and to use such information in discussion with key stakeholders, including Central Government and major developers.*
- *Hinkley Point C NNB in Somerset in South West England, the first NNB since Sizewell B, began main construction in 2016, and provides the opportunity for a new monitoring and auditing study, the results of which could flow into subsequent developments -- the next one planned being Sizewell C .*
- *This will be done under the 2017 EIA Regulations*

IAU research team

- *Professor John Glasson – Research Lead, Examining Inspector PINs*
- *Dr Bridget Durning*
- *Professor Martin Broderick-- Examining Inspector PINs and*
- *Kellie Welch*
- *Impacts Assessment Unit (IAU), School of Built Environment, Oxford Brookes University*
- *The IAU is an EC recognised centre for research and teaching in EIA*
- https://www.brookes.ac.uk/be/research/research-groups/impact-assessment/

Why monitoring and auditing?

- Environmental Impact Assessment (EIA) – get consent
- ‘Build it and forget it’ approach (Culhane 1993)
- Yet many major projects, in sectors such as transport, energy, minerals, waste and water, have long life cycles
- EIA should not stop at the decision
- Should be an adaptive process to achieve good socio-economic and environmental management over the life of the project, as advocated many years ago by Holling (1978).

2017 EIA regulations Schedule 4 Part 7 requires "Post –Project Analysis".

- **7.** A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, **of any proposed monitoring arrangements (for example the preparation of a post-project analysis).**
- That description should explain the extent, to which significant adverse effects on the environment are:
  - Avoided,
  - Prevented,
  - Reduced or
  - Offset, and
  - Should cover both the construction and operational phases.

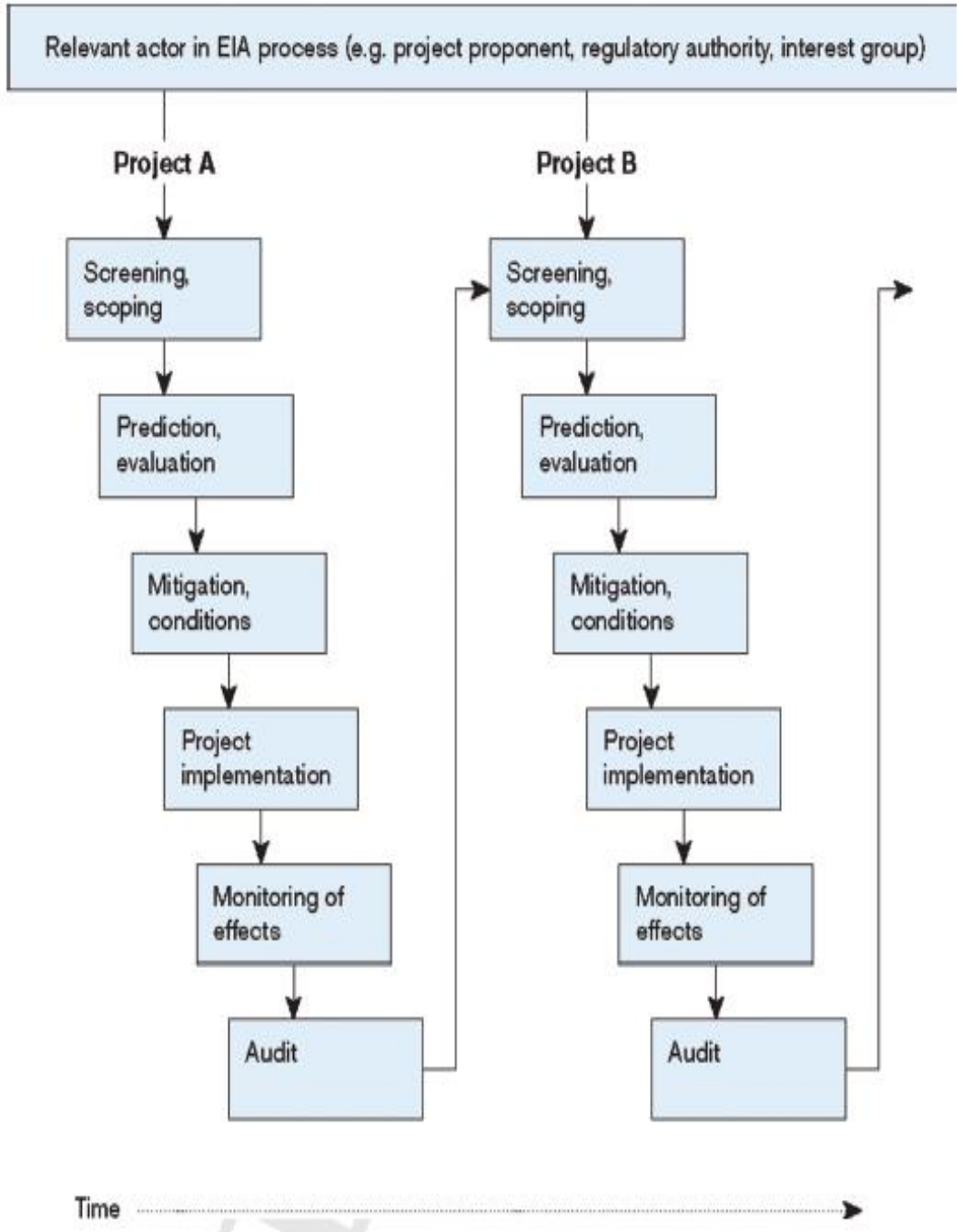
Monitoring and auditing NSIPs

Recent report by the National Infrastructure Projects Association (NIPA 2019):

- *There has been little research on the results of the effectiveness of the environmental monitoring and management during the construction of NSIPs (Nationally Significant Infrastructure Projects).*
- *Without this evidence it is difficult for Examining Authorities to make informed judgements about the adequacy or otherwise of this approach (adaptive management).*
- *The sharing of the findings of monitoring could improve decision making, could provide reassurance to communities for whom the anticipation of impact can be more daunting than the reality, and enable developers to improve environmental management practices.'*

Why Monitor? Some motivating factors for proponents

Key activities in EIA follow-up	More specific roles
Monitoring	Monitoring for conformance with standards
	Monitoring for compliance with conditions
Auditing	Evaluation of actual against predicted impacts
Management	Management for better project implementation
	Management for future consents and licences
Communication	Improved stakeholder communication on actual impacts of project and their management



2. Research Approach

HPC case study

- Hinkley Point C is the first UK NNB since completion of SZB in 1995
- It is located in Somerset, on the Bristol Channel, adjacent to HPA&B
- It is a £20bn project with a current construction period of 12 years
- Preliminary works were undertaken from 2012, but the main construction did not start until mid 2016
- It is currently in YR4 of main construction, with an onsite workforce of over 5000

Focus – on years 1-3 of main construction work – mega project

Using world’s largest crane – up to 250m tall, and can lift 5000 tonnes load

Socio-economic impact issues: mitigation and enhancement

-key factor is % local employment. How to increase local %?

-how to manage housing and services impacts of non-local workers?

-how to minimize local traffic impacts of several thousand extra commuters to/in the area?

-role of Community Benefits Packages

Research elements

Detailed sector studies	*Economic development*
	Transport
	Social and community
	Accommodation
	Environmental health
	Biophysical
Brief contextual studies	Governance for monitoring
	Comparative studies (London Olympics, Crossrail, Wylfa Newydd)
Explanations, gaps and recommendations	*Explanations of findings (positive and negative)*
	Gaps in monitoring
	Recommendations (HPC and NNB generally)

Approach (continued)

The sector studies have three main steps:

- ***Identifying issues*** *and obligations; indicators and KPIs*; and key data sources, drawing in particular on HPC ES/DCO/S106 and the LIR.
- ***Monitoring impacts*** – *establishing findings, key indicator trends* and events over main construction stage to date, drawing on ***publicly available information***
- ***Auditing impacts*** – *assessing degree of accuracy of monitoring findings* against predictions; explanations of differences; gaps in monitoring and future proposals.

Some research issues:

- fragmented array of indicators/KPIs across massive documentation; contested indicators
- Some good monitoring data (eg on transport, health, some employment); other data much more problematic
- Mix of quantitative and qualitative. Assess against predictions; quantitative ranges where possible. Simple colour coding.

Use of simple RAG colour coding summary for findings:

G	Predictions very accurate with actuals. Fully compliant with conditions/obligations
LG	Most predictions are good, but with a few topic and/or time gaps, and inaccuracies; largely compliant
A	Mixed accuracy/with several topic and/or time gaps, and inaccuracies; only partially compliant
O	Prediction inaccuracies/gaps in many areas; very limited compliance
R	Predictions very inaccurate; non-compliant
B	No information available; auditing not possible at the time of the study

3. Overall summary of HPC monitoring and auditing findings: accuracy of actual vs predicted impacts to date

Sector	*Brief comments*	*RAG coding*
Economic development	Good in many areas--local content, training/education, apprenticeships etc. Mitigation/enhancement measures working well. Debate about some data/gaps.	
Transport	Good against predictions for many indicators -- mode share for workforce journey to site and HGV delivery caps. Issues on driving to P&R sites, and fly parking.	
Social and community	Good performance against indicators, especially for health (on-site Medical Campus), and community safety, including Worker's Code of Conduct.	

Overall summary (continued)

Sector	***Brief comments***	***RAG coding***
Accommodation	Complicated by differing views of predictions and definitions. Where there is data, there does seem to have been some useful housing support initiatives.	
Environmental health	Team found little publicly available information on monitoring of impacts, such as on noise, air and water quality, other than a low level of complaints.	
Biophysical environment	For impact topics, such as ecology, information not publicly available or located to date.	

4. Some, more detailed, sector studies

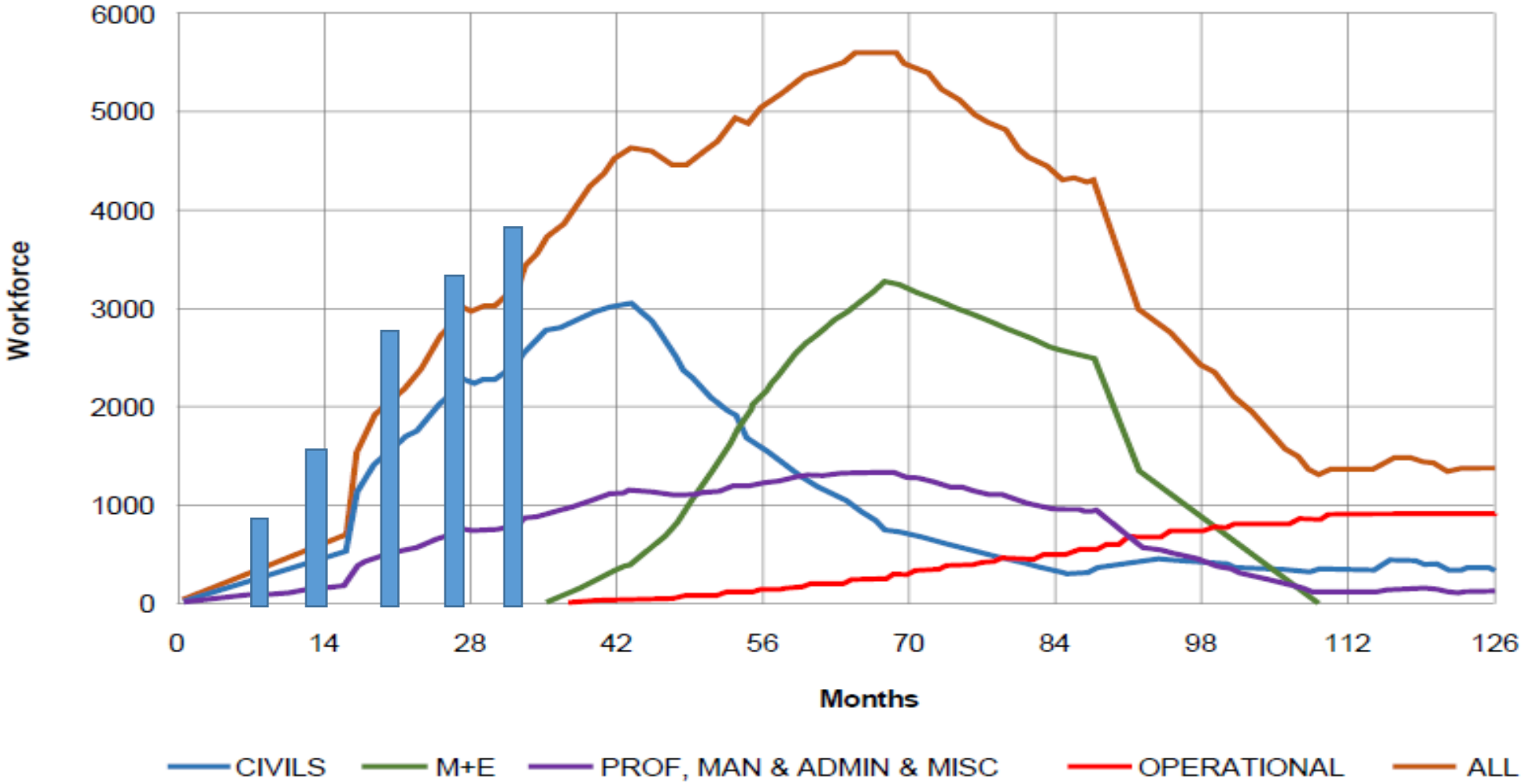
Economic Development ***-*** *some examples from employment*

Indicator/KPI	***Examples of audited impact***	**RAG coding**
Overall level of workforce	Actual levels near/above 2012 prediction, but some caveats.	
Local content: CDCZ	Percentages better than predictions; but missing disaggregated data	
Recruitment from the unemployed	At 1% -- well below 8% target, but context has changed	
Apprenticeships	Good; 433 (April 2019) exceeds DCO target, and on course for 1000 aspirational target.	
Recruitment from women	19% female is good for civils work stage of major project	
Training and educational initiatives	Wide range of transformational initiatives, underpinned financially by EDFE, and others.	

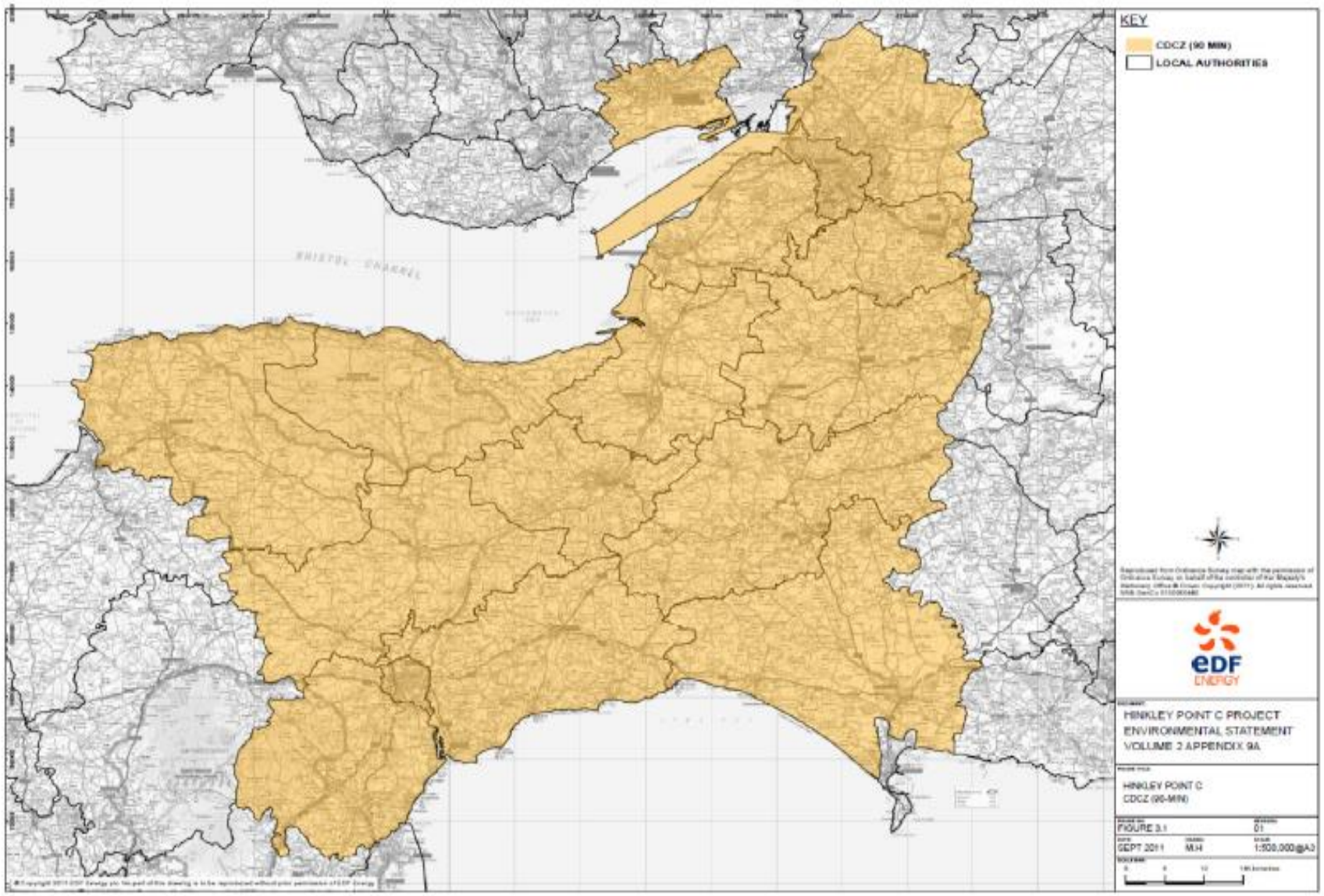
Economic development – *supply chain examples*

Indicators/KPIs	***Audited Impacts***	***RAG coding***
Local and regional supplier registrations	Good level of registrations. Particularly good local level--well in advance of 750 initially anticipated for Somerset	
Number and value of contracts awarded to Somerset and wider SW region companies	In aggregate, the £982m for the SW supply chain region, and anticipated another £700m, is well on way to easily exceeding the predicted £1.5bn for total construction stage	
Potential negative impacts on local firms and areas	Difficult to identify as no hard data here (survey needed). From discussions with Somerset Chamber of Commerce, the impact is mixed	
Impacts on tourism sector in Somerset	Local tourism industry confidence seems high. Mitigation measures, provided in advance, have helped. There is also the added bonus for some tourism accommodation providers of much fuller occupancy over the calendar year.	

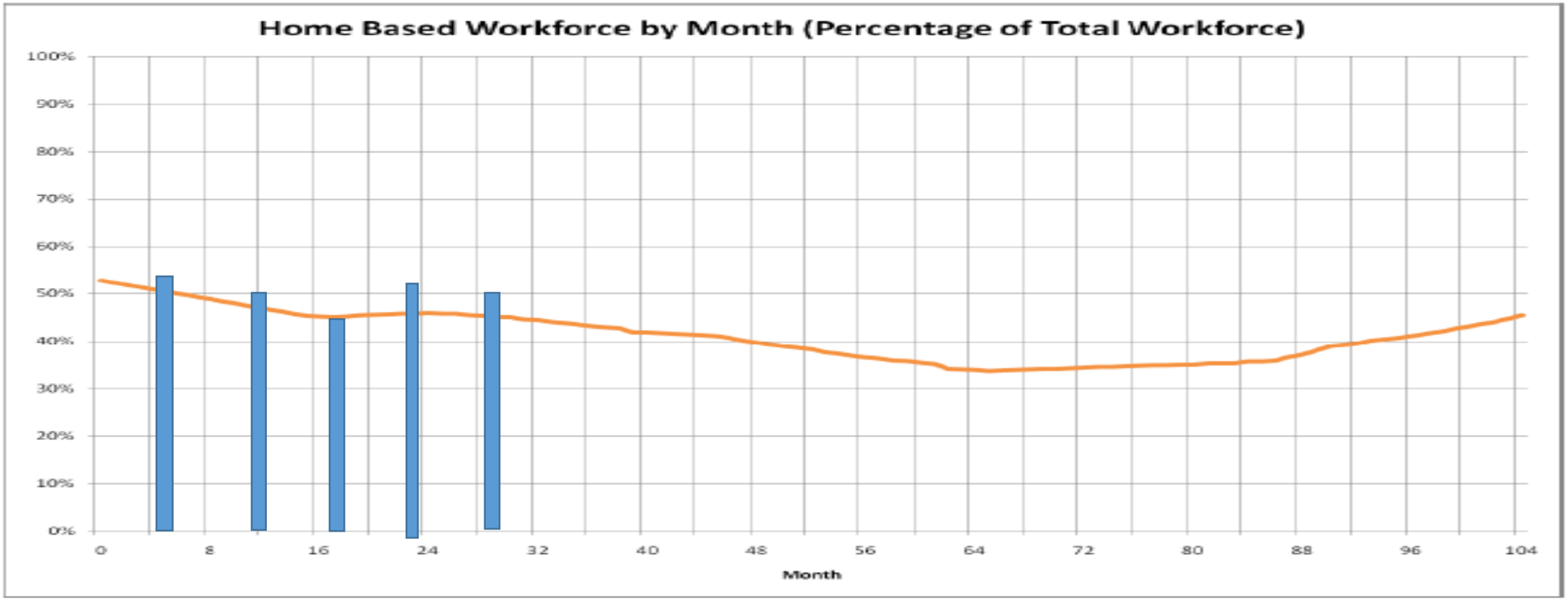
Construction Workforce Labour Demand Curve —Estimated (curves) and Actual (blue cols) Workforce Numbers to date (Month 0 is taken as mid-2016)



HPC Construction Development Commuting Zone (CDCZ)



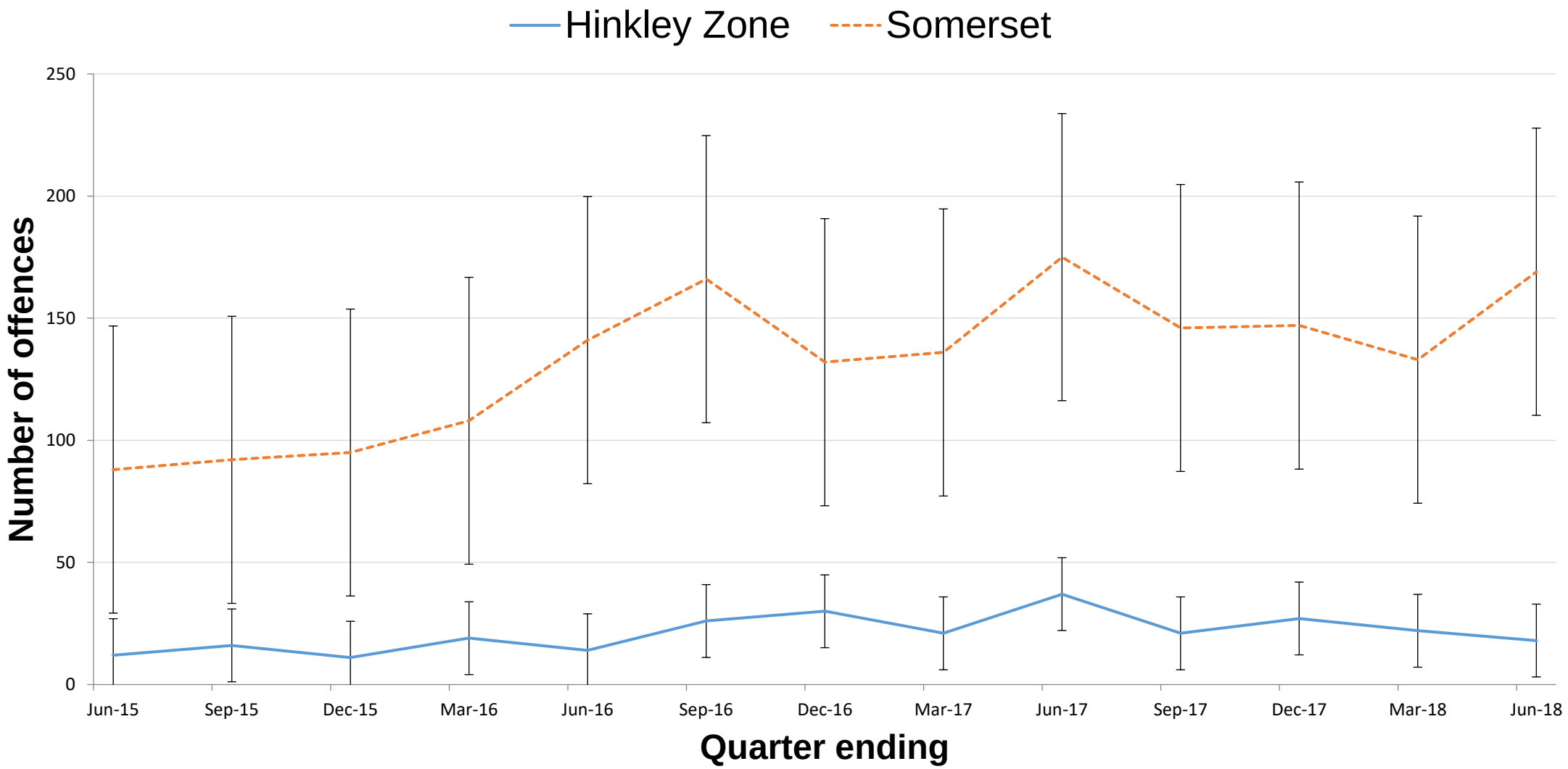
CDCZ actual local content % (cols) compared with predicted (curve)



Social and community – *some examples*

Indicator/KPI	***Examples of monitored impacts***	***RAG coding***
Local health	No significant change in health issues (eg mental, sexual) during build up of construction stage. *On-site Medical Centre* very successful in minimising impacts on NHS services.	
Local health services		
Crime and local policing	Avon and Somerset Constabulary (ASC) data shows crime trends in Hinkley Zone are similar to trends in Somerset.	
Specific crime issues: night time economy	Sensitive locations (eg Bridgwater Town Centre, Stogursey) have shown crime falls/ little change over 2016-2018 period.	
Local quality of life (eg Stogursey Parish)	PC minutes indicate welcome use of Community Impacts Mitigation (CIM) fund. Evidence of increasing impacts on wellbeing from noise, traffic, caravan and site spoil-dump issues.	

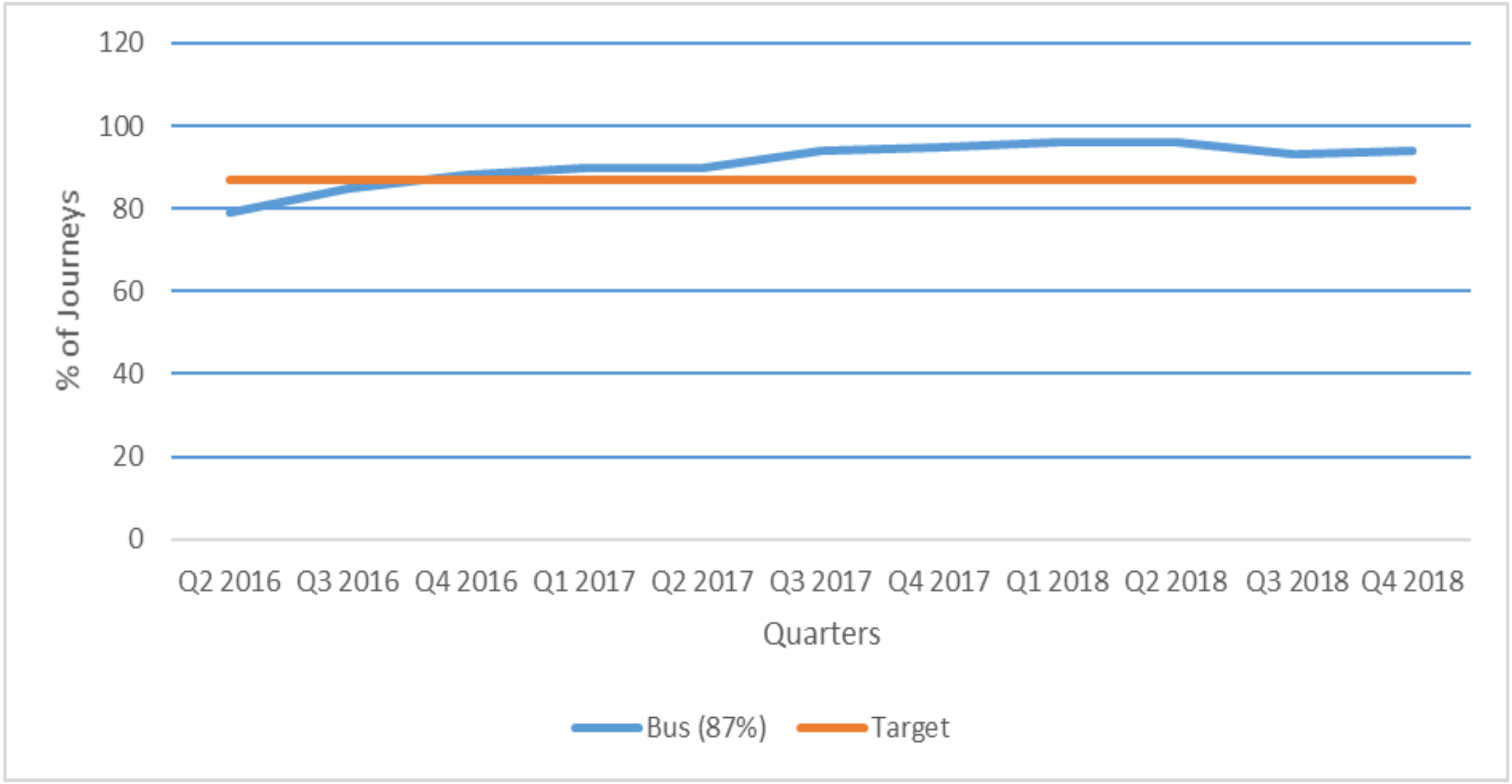
Hate Crime


Hinkley Zone
Somerset
Number of offences
250
200
150
100
50
0
Jun-15
Sep-15
Dec-15
Mar-16
Jun-16
Sep-16
Dec-16
Mar-17
Jun-17
Sep-17
Dec-17
Mar-18
Jun-18
Quarter ending

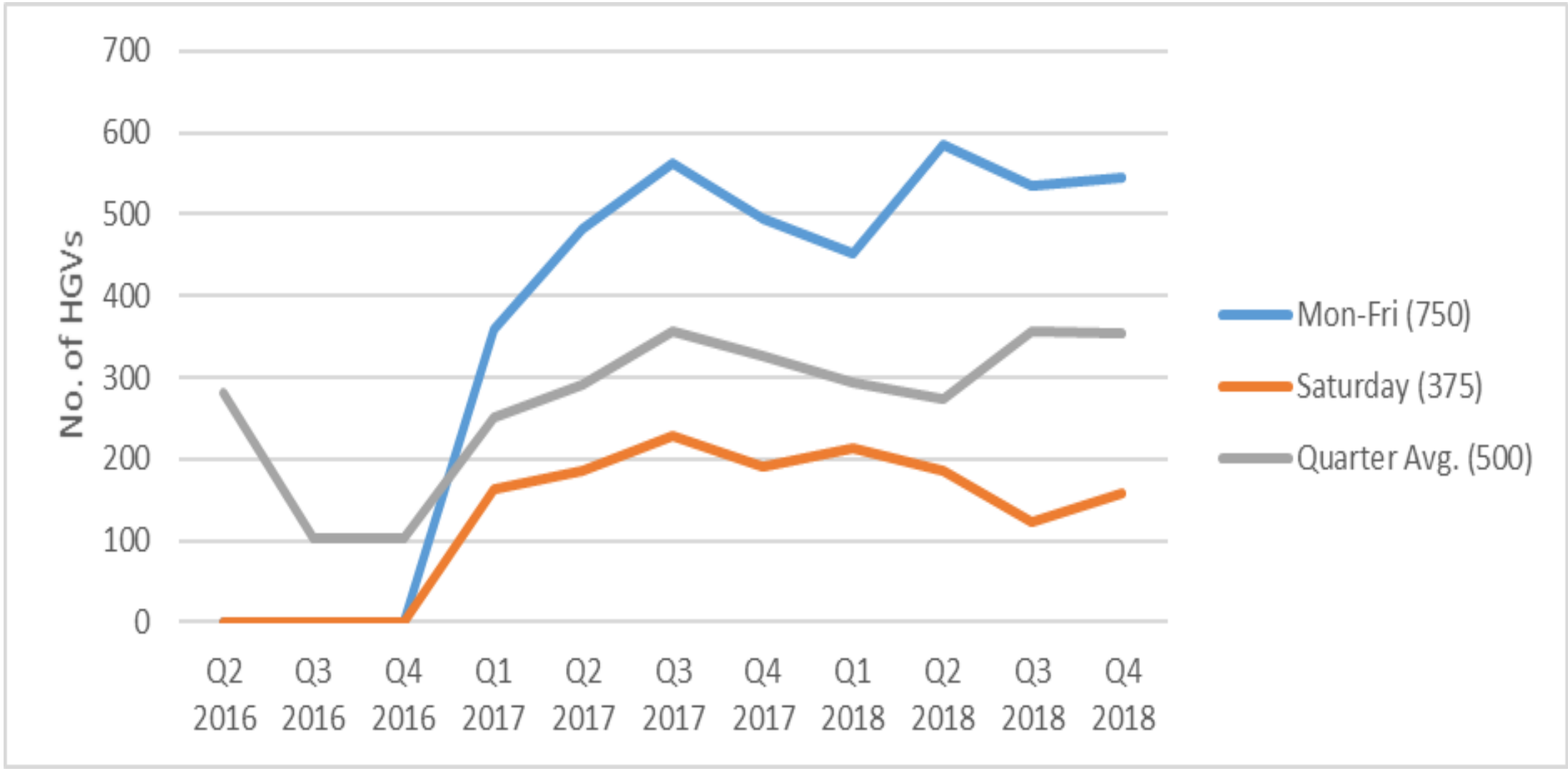
Transport – *some examples*

Indicator/KPI	***Examples of monitored impact***	***RAG coding***
Workforce--journey to work to HPC site	HPC Site Journey to Work by Bus has a target of 87%. Since Q1 2017, has been well over 90% for each quarter.	
Workforce – travel to P&R sites	Travel to and from J23 and J24 dominated by car drivers with target of 58/60% being consistently exceeded with 80/75% respectively. Promotion of HPC Car Share to meet targets in hand.	
HGVs – deliveries targets	Consistent compliance with caps : Mon-Fri (750), Saturday (375) and Quarterly Average (500)	
HGVs – breaches of construction works limits	Breaches of HGV limits, timing restrictions, routing violation have all been consistently in the very low single figures	

Journey to work to HPC site by bus



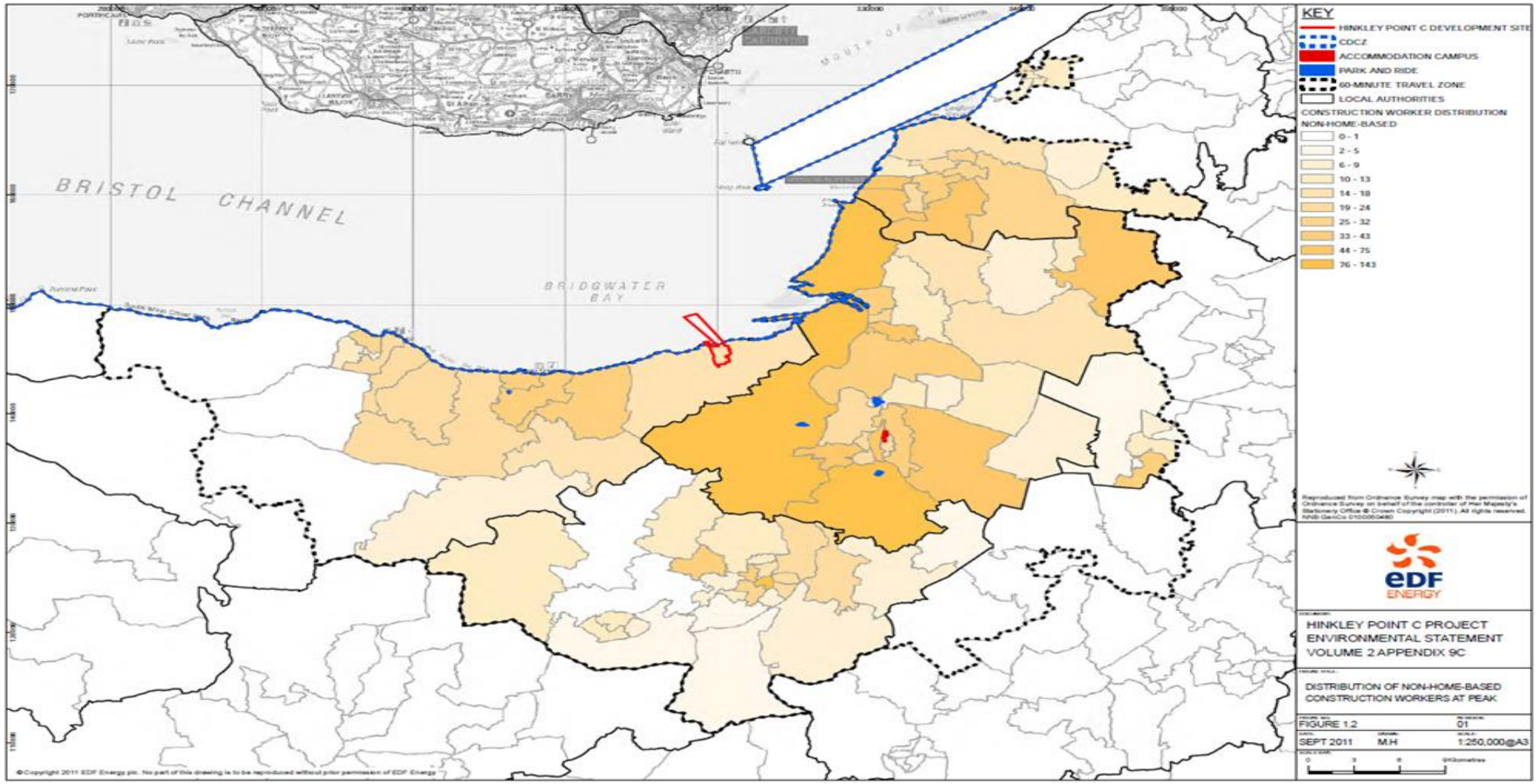
HGV FMF actuals against local targets (daily)



Accommodation – *some examples*

Indicators/KPIs	***Some examples***	***RAG coding***
Geographical distribution of non-home based (NHB) workers	Numbers/% in Sedgemoor well in excess of predictions, although not peak, and very recent Bridgwater Campus.	
Tenure type of NHB workforce: PRS	Jan 2019 numbers exceed predicted peak thresholds for Sedgemoor. Initiatives in place to increase PRS capacity	
Tenure type of NHB workforce: Tourist, B&B, Camping and Caravans	Roughly near predictions; market forces resulting in more caravan/ 'bottom end' B&B and 'off-peak' season demand.	
Tenure type of NHB workforce: Campuses	Good use of on-site campus. Qualitative comments that new NHB workers are 'almost exclusively staying in campuses.'	Site / Bridg
Implementation of EDFE local housing support strategy/ fund	Many gaps in publicly available monitoring data/thresholds. Available data suggests useful housing support initiatives.	

EDFE Predicted distribution of NHB workers at peak construction



Distribution of NHB workers at Jan 2019 –HPC report to SEAG

January 2019 – Latest Position – HPC Site

Total number of workers on-site

3,787

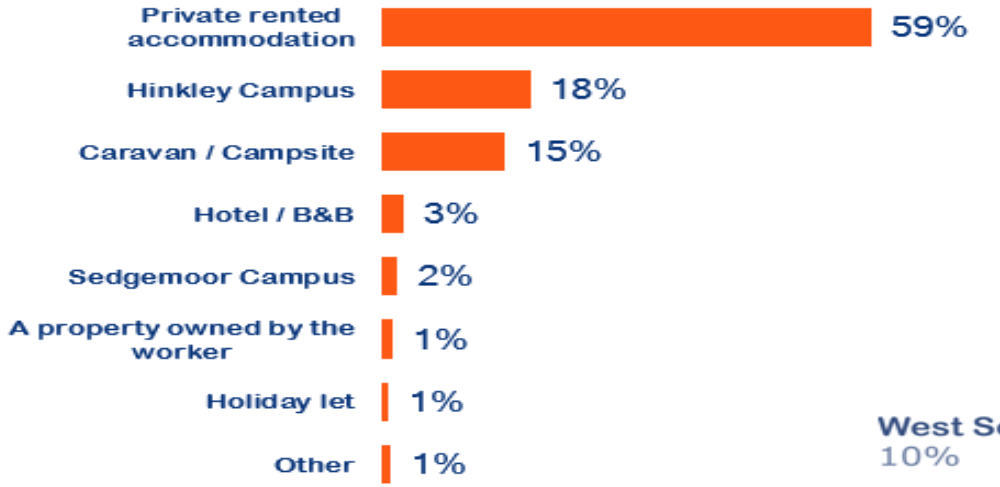
Non-homebased workers

50%

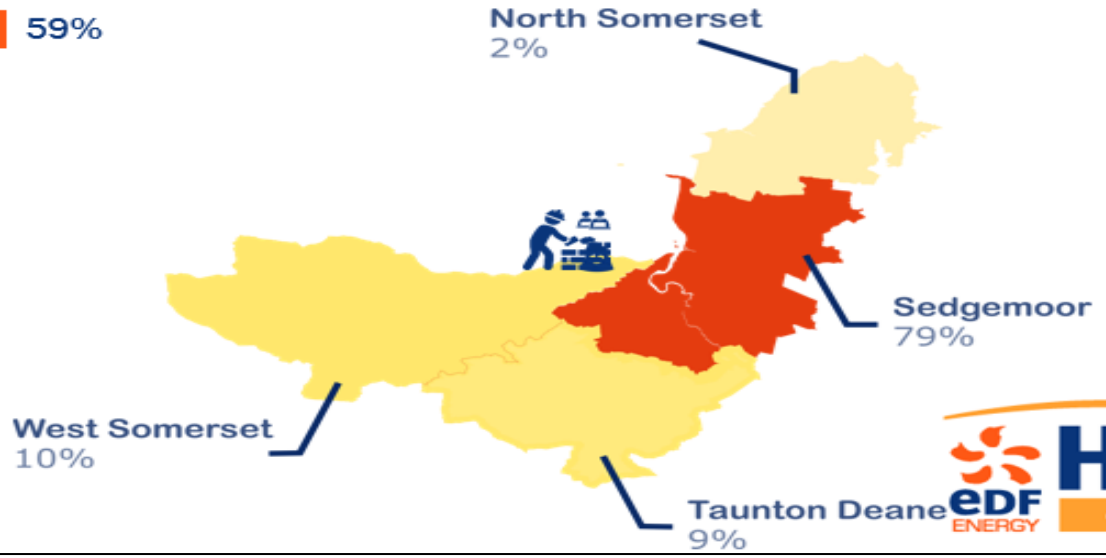
of on-site workers have a permanent home address in Somerset

46%

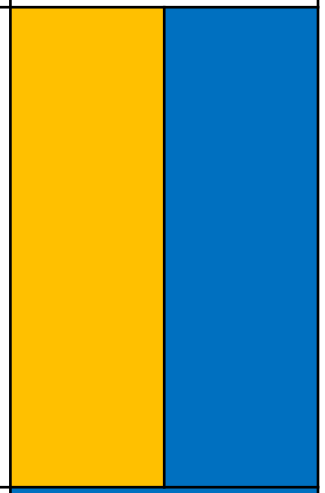
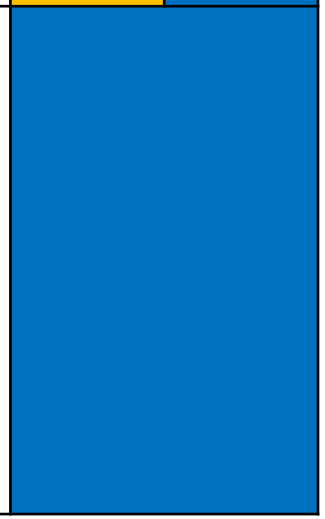
Percentage of non-homebased workers by their accommodation type



Percentage of non-home-based workers living in CDCZ (60 min) by district



Environmental Health and Biophysical *– some examples*

Sector	***Comments on monitoring and auditing***	***RAG coding***
Environmental health: *noise and vibration, air, light, water quality, waste and radionuclides*	Regulated standards and thresholds; assumed monitoring in place. However, team found little publicly available information to confirm this, other than relatively low level of complaints.	
Biophysical : *landscape and visual, ecology, archaeology, and flood risk*	Data currently not publicly available/ not located. Management plans exist (eg EcMMP); assumed mitigation and monitoring is in hand. Information held by various bodies, including EDFE.	

5. Explanation of findings and differences between actual and predicted impacts

Positive findings – *many positive findings, with* ***effective mitigation and enhancement measures****, including:*

- ***Transformational training and education initiatives***
- ***HPC Site Campus, with On-Site Medical Centre***
- ***Workers Code of Conduct***
- ***Whole array of Management Plans***
- ***J23 and J24 P&R facilities, and bus links to site***
- ***Whole array of funding initiatives***
- ***Tourism support***

Negative findings *– some underlying causes*

- ***Time delays in commencement of construction project (5 years)***
- ***Project modifications***
- ***Changes in baseline conditions***
- ***Lack of clarity on definition of some indicators***
- ***Lack of trigger points in DCO/s106 obligations and requirements***
- ***Over-focus on peak construction impacts***
- ***Degree of accuracy of some predictive techniques***

Plus challenges of major UK NNB project (with no recent UK comparators)

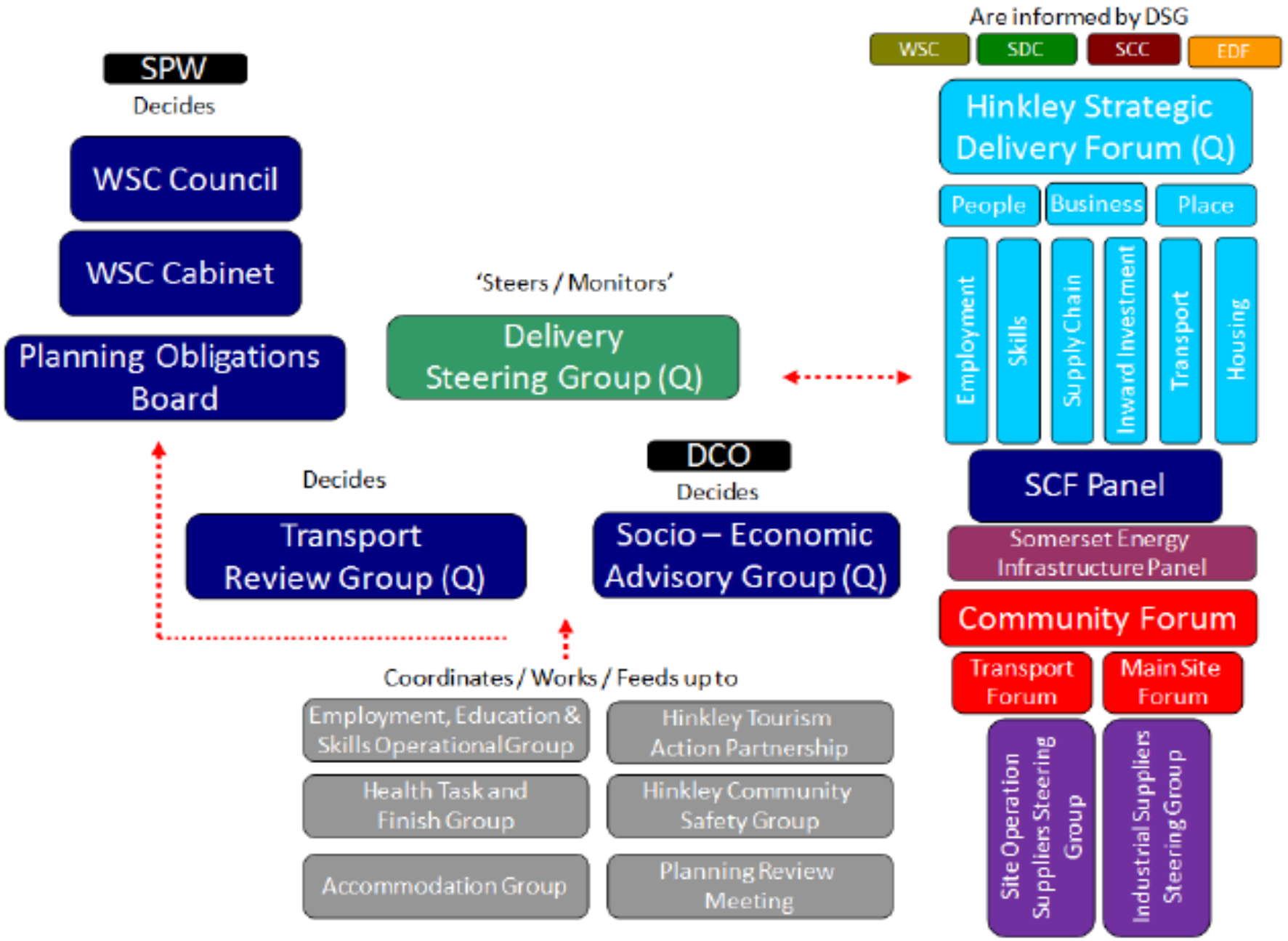
***Gaps** – in monitoring organisation and process, for example:*

- **Lack clear monitoring framework (socio-economic and environmental).**
- Not always clear relationships between developer and LAs.
- Not always clear '**read across**' from requirements / commitments to monitoring.
- Not always clear who is responsible for collecting information (eg environmental).
- Little evidence of independent analysis and verification of information.

***Gaps** – in data, for example*

- **Disaggregated employment and supply chain data**
- Full, transparent and publicly available Workforce Survey findings
- Various omitted transport issues
- Indicators missing/not publicly available (eg: accommodation, environmental).

Somerset LAs' HPC Construction Monitoring Organisational Framework



6. Learning from other projects/DCOs -- examples

London Olympics

- **a detailed and disaggregated assessment of a wide range of both socio-economic and bio-physical environmental impacts**

- an independent verification facility, via Commission for Sustainable London

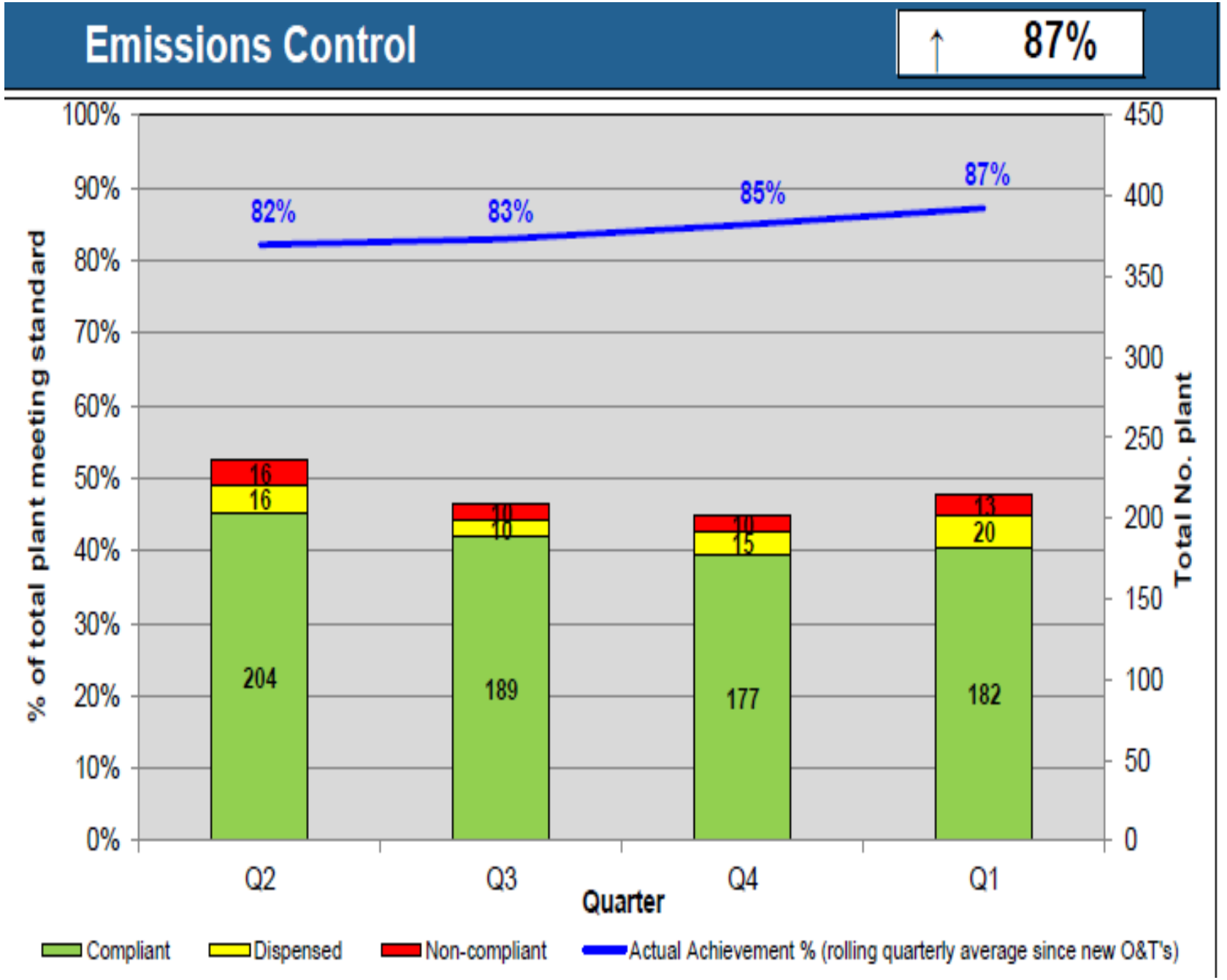
	Olympic Park		Athletes' Village	
Workforce on site	6500	(benchmark)	5400	(benchmark)
% resident in host boroughs	21	--	27	--
% resident elsewhere in London	34	--	40	--
% resident elsewhere in UK	42	--	30	--
% residing outside UK/ or no information	3	--	3	--
% previously unemployed	12	7	10	7
% women	4	11	3	11
% disabled	1	3	0.5	3
% BAME (Black, Asian or Minority Ethnic)	19	15	13	15

Crossrail

a ‘Register of Undertakings and Assurances’ for the project –81 pages

detailed monitoring information across range of socio-economic and biophysical environmental impacts. For socio-economic data, there are details of contracts greater than £10,000

a Crossrail website reports summary sustainability information with sections on: archaelogy; economic sustainability; environmental sustainability; Crossrail innovation programme; Crossrail learning legacy; and health and safety



Wylfa

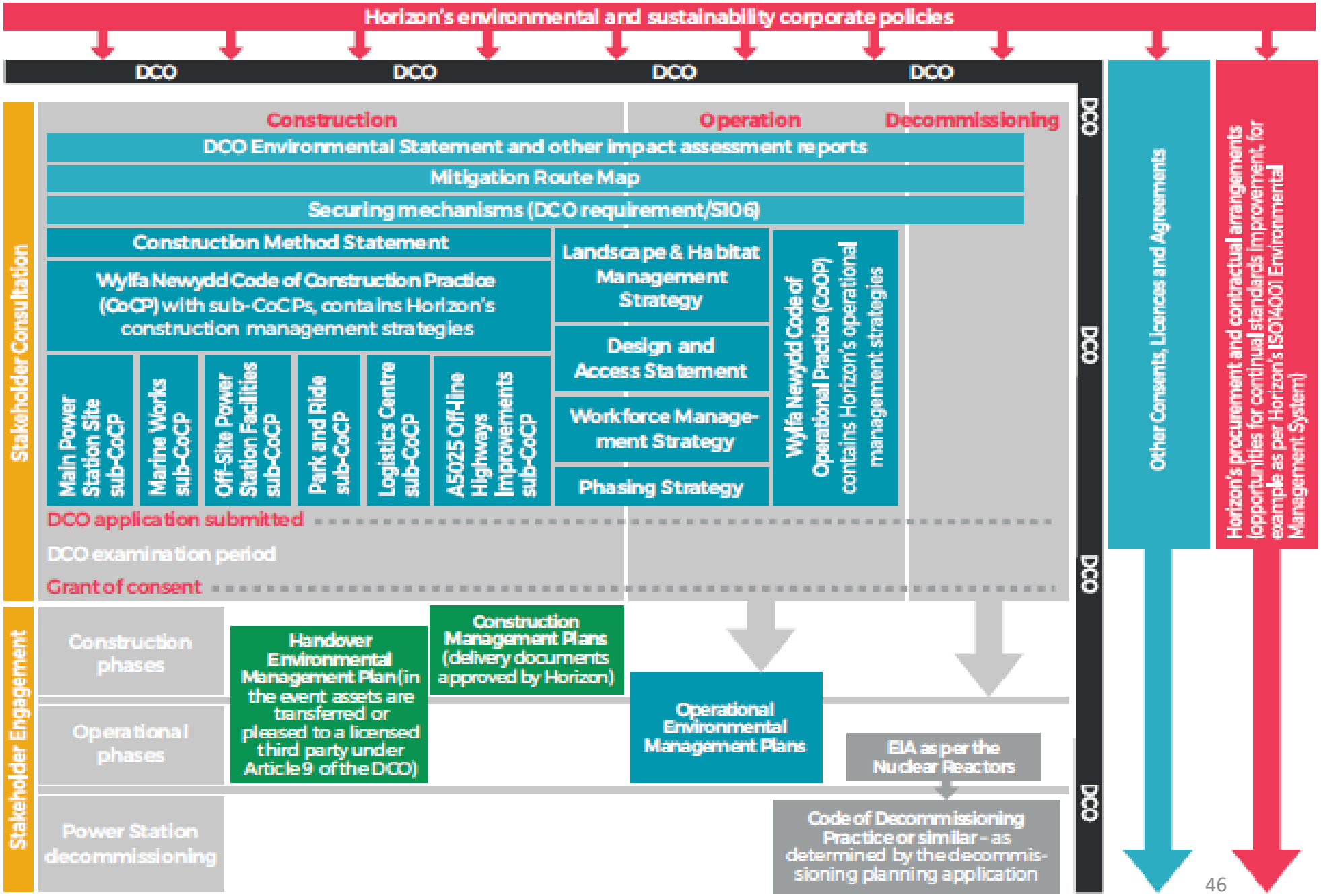
Wylfa Newydd Engagement Framework CoCP (June, 2018)

3.2.2 Horizon will provide regular reports on monitoring of air quality, noise and water management to the Environment and Built Heritage sub-group; and on traffic to the Transport sub-group.

3.2.3 Horizon will provide monitoring in relation to socio-economic impacts through the relevant engagement sub-group identified above, for example, monitoring data from the Workforce Accommodation Management Service (WAMS) will be provided to the Accommodation and Tourism Services sub-group.

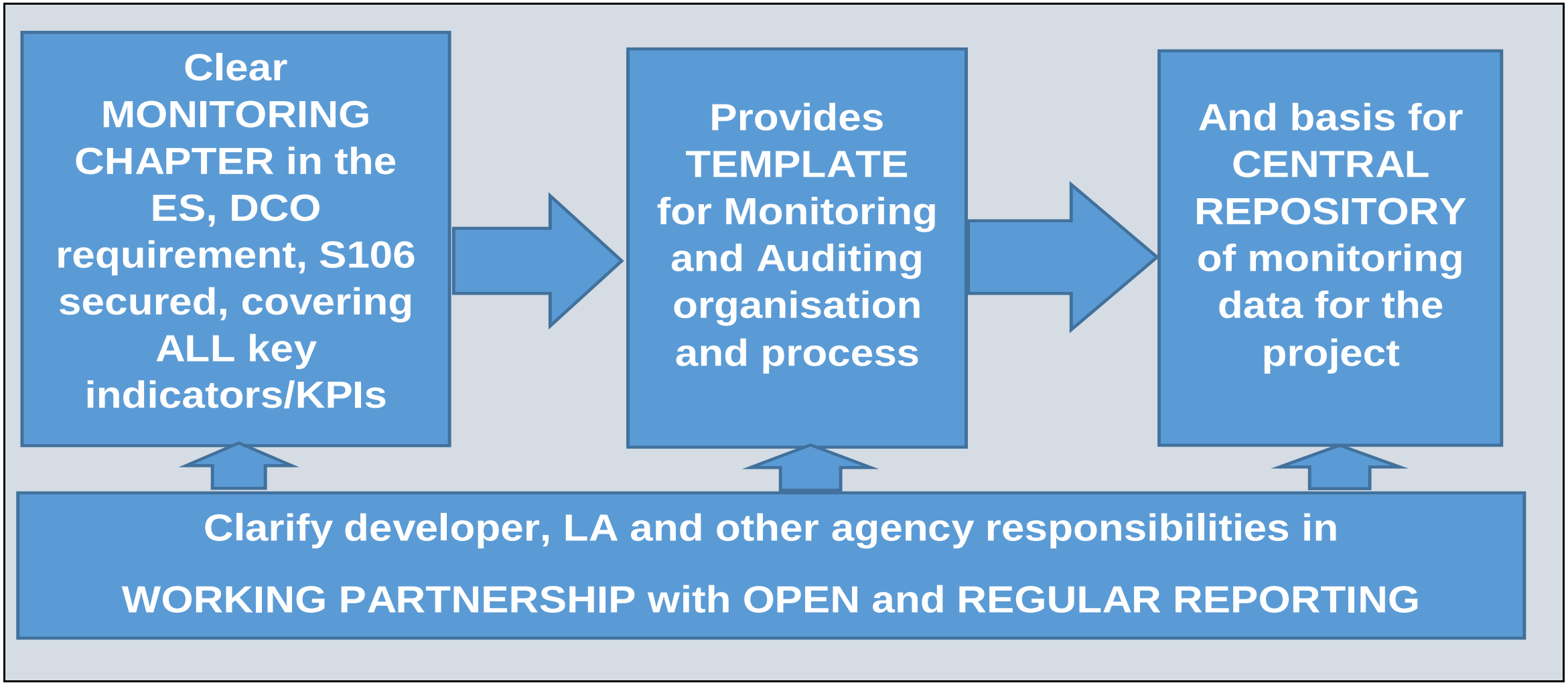
3.2.4 The engagement sub-groups above will provide information in relation to decisions and actions taken in relation to monitoring activity to the Community Liaison Group (CLG).

Wylfa Newydd --summary of codes and management plans and strategies



7. Some interim recommendations -- *Generic for future NNB projects*

Pre-construction planning and assessment – developer and LAs



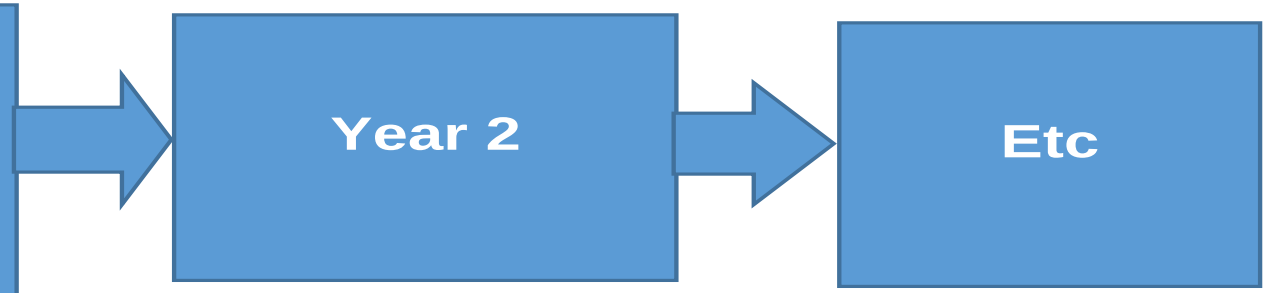
Construction stage – developer and LAs

Monitoring and auditing should be a *planning and implementation activity* with a number of features including:

A **MONITORING WEBSITE**, public access, reviewing impacts / reporting concerns

A consistent 3-stage '**event-action-plan approach**' to manage audited impacts

Publicly available **Annual Impacts Monitoring and Auditing Report—Year 1**



Openness to refresh against a timeline in an ADAPTIVE IMPACT ASSESSMENT approach; plus an openness to INDEPENDENT ANALYSIS AND VERIFICATION

Pre-construction planning and assessment -- FAO Examiners

- Adopt robust approach in DCO to ***clarify commitments***, and ***establish process of monitoring and public reporting of performance*** against a full set of indicators.
- Ensure clear '***trigger points***' in DCO in relation to completion of associated developments – such as temporary jetty, campus accommodation.
- Ensure predictions contain ***longtitudinal timelines***, showing evolution of impacts over key phases of construction stage.
- **Establish agreement on key socio-economic issues**, such as *what is a worker, what is latent accommodation?*
- Recognise opportunities for ***potential legacy benefits*** , including housing (now possible for DCO applications).

*Specific recommendations for **refresh** of HPC monitoring and auditing*

Review organisation and process for monitoring (+ generic issues)

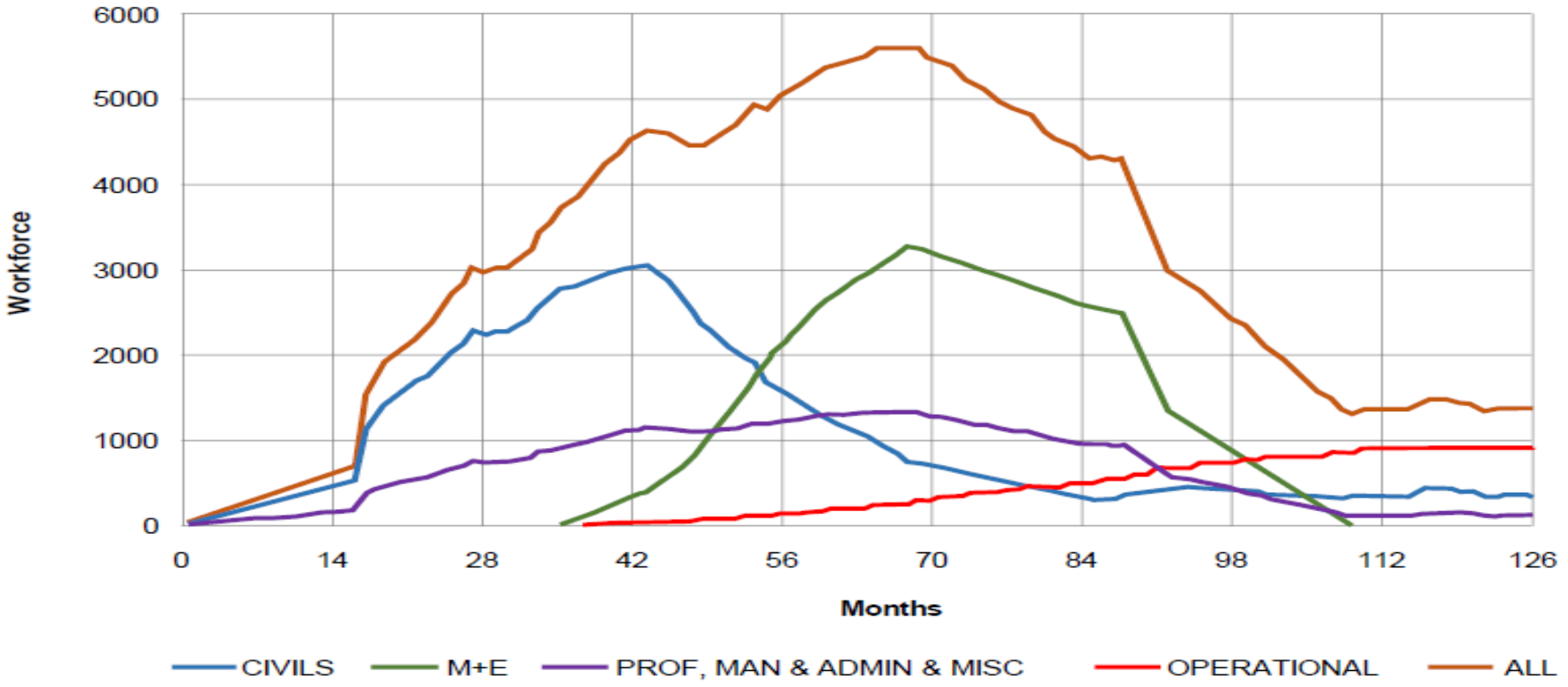
- *Review operational effectiveness of monitoring groups; reorganise as needed*
- Provide full, transparent and publicly available Workforce Survey data
- Consider some bespoke survey activities (eg impact of HPC on local firms).
- Monitor evolution of key issues (eg worker accommodation tenure, community safety) as workforce builds up to peak, and Bridgwater Campus fills

Fill key data gaps

- disaggregated employment and supply chain
- omitted transport issues
- accommodation data (campus data opportunity)
- wellbeing of local communities local (especially older residents)
- *environmental health and biophysical environmental impacts*

Next steps in longtitudinal survey ----

a peak impacts study in two years



Next steps in HPC project impact assessment and management

One of our recommendations:

It should be recognised that some construction impacts may require a refresh against a timeline to review and update baseline conditions, actions and project evolution. This should be part of an effective ***adaptive impact assessment process*** (plan, monitor and manage).

EDFE (November 2019) invited tenders for a major refresh of its :

- Peak construction workforce numbers– potential substantial increase
- Accommodation strategy – comprehensive review
- Socio-economic assessment; Amenity and recreation assessment; Health impact assessment ; Community safety management plan – all update

Thankyou for your attention – questions please

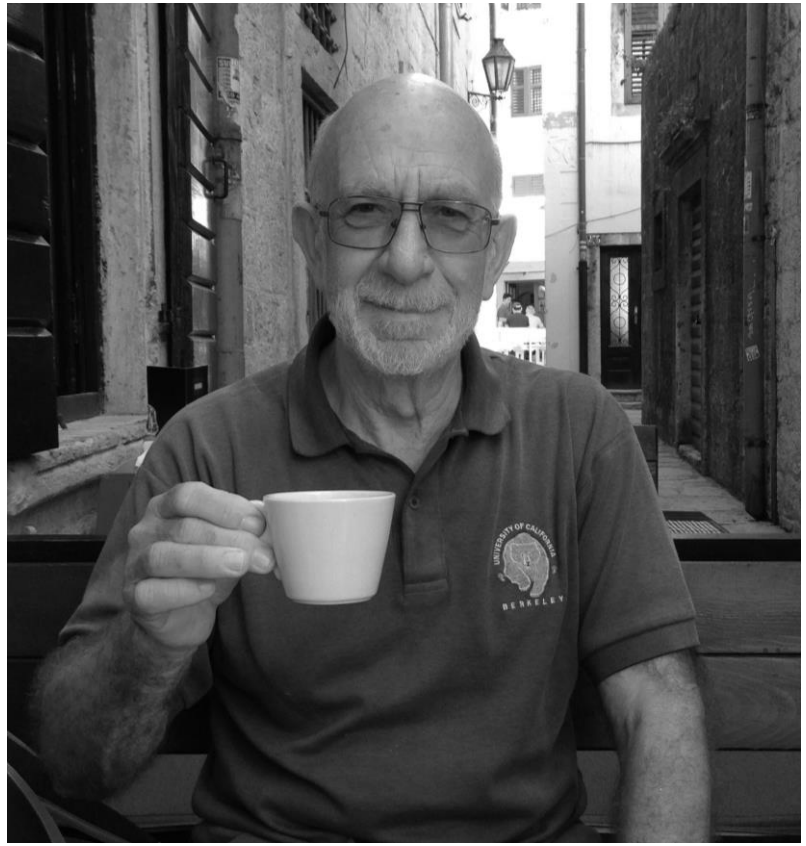
jglasson@brookes.ac.uk

Questions & Answers

IEMA Transforming the world to sustainability

Prof. John Glasson

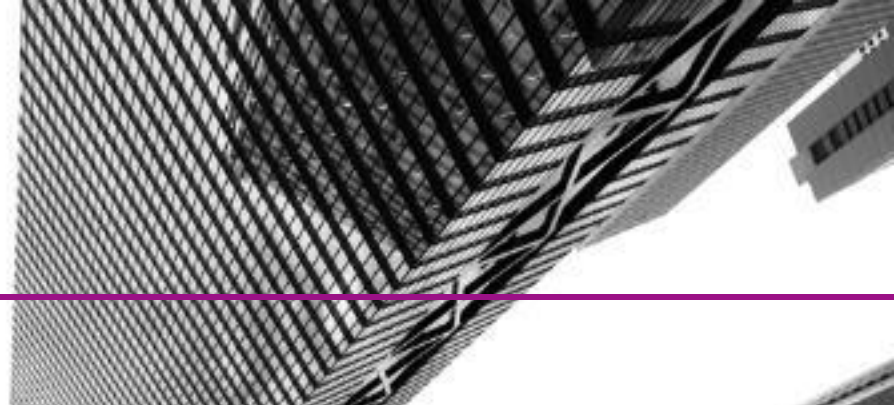
Professor Emeritus Oxford Brookes University; Founding Director of Oxford Institute for Sustainable Development; Examining Inspector for National Infrastructure at the Planning Inspectorate



Dr Rufus Howard

Impact Assessment Policy Lead at IEMA

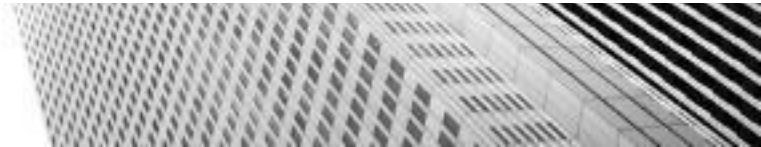
IEMA Transforming the world to sustainability



Impact Assessment

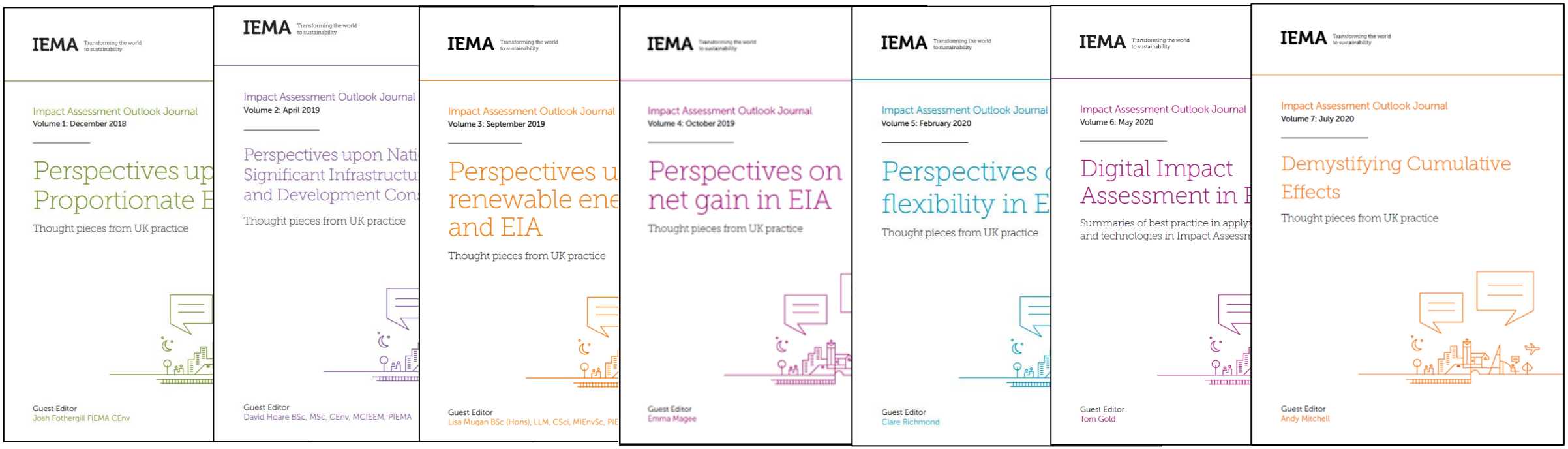
- Impact Assessment Network
- IA Network Steering Group
- EIA Quality Mark
- IA Outlook Journal
- EIA Practitioner Register
- Guidance, Webinars and Events

1. 1993 Guidelines for the Assessment of Road and Traffic
2. 1995 Guidelines for Visual Impact Assessment
3. 1995 Guidelines for Baseline Ecological Assessment
4. 2002 Guidelines for Visual Impact Assessment 2nd Edition
5. 2004 Guidelines for Environmental Impact Assessment
6. 2011 Special Report on the State of EIA in the UK
7. 2013 Guidelines for Visual Impact Assessment 3rd Edition
8. 2014 Guidelines for Environmental Noise Impact Assessment
9. 2015 EIA Guide to Climate Change Adaptation and Resilience
10. 2015 EIA Guide to Shaping Better Quality Development
11. 2016 EIA Guide to Delivering Better Quality Development
12. 2017 EIA Guide to Assessing GHG Emissions and their Significance
13. 2017 Health in Environmental Impact Assessment: A Primer
14. 2017 Delivery Proportionate EIA Strategy
15. 2020 EIA Guide to Climate Change Adaptation and Resilience 2nd Edition
16. 2020 EIA Guide to Materials and Waste in EIA
17. 2020 Digital Impact Assessment: A Primer
18. 2020 EIA Guide to Major Accidents and Disasters (forthcoming)



IEMA Transforming the world to sustainability

Good Practice: IA Outlook Journal



2018 2019 2019 2019 2020 2020 2020

IEMA Transforming the world to sustainability

Thanks for joining us

You will be able to access todays slides and recordings on iema.net. Simply log in and click on ‘Watch again’ on the ‘Resources’ tab.