

# For a low-carbon, and energy-efficient built environment

COP24 EU SIDE EVENT

5 December 2018

Peter Boswell

- Bringing project delivery into the picture: the way we live and the way we work must change.
- However: “We have our way of doing things. If you want changes, speak to our industry body”.
- Utility-scale Offshore Wind Farms (UOWF) = grid-tied, high-rise Building Integrated Photovoltaics (BIPF)

## Moving beyond efficiency to practice

Policies and regulation to shift from design and material aspects of a building.

Recognise rebound effects and building performance findings.

- Projects to be based more on how new technologies introduce new everyday norms and new practices.
- Promote technological development in ways that make people and practice change in a direction toward less energy consumption.

In spite of apparent inconsistencies in policies, the way we live and the way we work must change.

The issue; inefficient and inadequate project delivery models jeopardise project outcomes, notably potential contributions to reducing energy use and carbon emission.

## BIPVs and UOWFs

Systems integration essential for Utility-scale Offshore Wind Farms (UOWF) and grid-tied, clad, high-rise Building Integrated Photovoltaics (BIPF):

- many interfaces
- complex, integrated systems
- sector coupling on the horizon
- similar stresses (environmental)
- similar impacts (visual, environmental)
- similar size (100m+) & numbers of structures (13000+; more than for the non-renewable energy sector)

### UOWF multi-contracting

- design-build packaging preferred
- turbines + balance of plant
- owner responsible for co-ordination (overlay contracts with a wrap-around contract).
- authorities now endorse the standard industry approach (multiple contracts with “consistent” terms for negotiation, etc; single point procurement.
- FIDIC widely used.

## BIPVs and UOWFs

Systems integration essential for Utility-scale Offshore Wind Farms (UOWF) and grid-tied, clad, high-rise Building Integrated Photovoltaics (BIPF):

- many interfaces
- complex, integrated systems
- sector coupling on the horizon
- similar stresses (environmental)
- similar impacts (visual, environmental)
- similar size (100m+) & numbers of structures (13000+; more than for the non-renewable energy sector)

### Design-build for buildings

- Owner contracts with a single entity (a contractor or a design-build team including the contractor) which is responsible for the project design & implementation.
- Design features & price for tender selection; variations possible.
- USA , 2014: design-build used for 49% of non-residential new buildings.
- Essential for whole-building.

## Whole-building = UOFW whole-system

BIPV and UOFW both interface driven.

Disciplines tend to work in isolation, often with very different driving goals.

BIPF expected to benefit from whole-building:

- tools
- procurement & delivery processes.

Bring in UOFW experience.

## Whole-building

Highly integrated building design & construction for complex, high-rise structures requires:

- design tools
- smart, integrated controls
- optimised interactions between the building envelope & subsystems.
- new channels & methodologies for collaborative communication, problem solving & decision making across disciplines.
- restructuring of compensation & the handling of liabilities.

## Whole-system / whole-building

- “institutional logics” conspire against the delivery of UOWF & BIPV systems.
- Rules set outside of the technological system have the explicit intent of directing delivery processes (e.g., project schedules, ongoing negotiation).
- Rules can be modified only with great effort & often involves appeal to the relevant institutional body.
- “We, designers and others, have our way of doing things. If you want changes, speak to our industry body”.

### What to do?

- The context

While dramatic & rapid decreases in CO<sub>2</sub> emissions are sought, many governments are taking a staged approach with clear pathways.

- An approach?

Have processes in place for a reasonably orderly discussion of the changes that are needed for procurement & delivery & how these changes can come about.



Whole systems / whole building delivery built into the ISO 37101 community / urban management system standard.

Updating procurement under the FIDIC Statement of Commitments to build the built environment's sector's capacity.

Over 100 FIDIC national Member Associations (one industry – one member per country)

HQ in Geneva – represented by EFCA.

Sustainable Development Committee supported by committees for risk, contracts, international affairs, and integrity.

- USD 4.7t p.a. new-build investment.
- 80% investment is urban & peri-urban.
- USD 650b p.a. demand for consulting engineering services.
- 50% of demand is met by firms whose main business is to supply consulting engineering services.
- 40,000 firms worldwide; 1.5 million professional staff.
- Smaller firms generally specialised; larger firms provide the full range of services; all disciplines involved.