
PerspECCtive

Theme:
Doing More with Less: A Roadmap to Capital Efficiency

Advanced Work Packaging

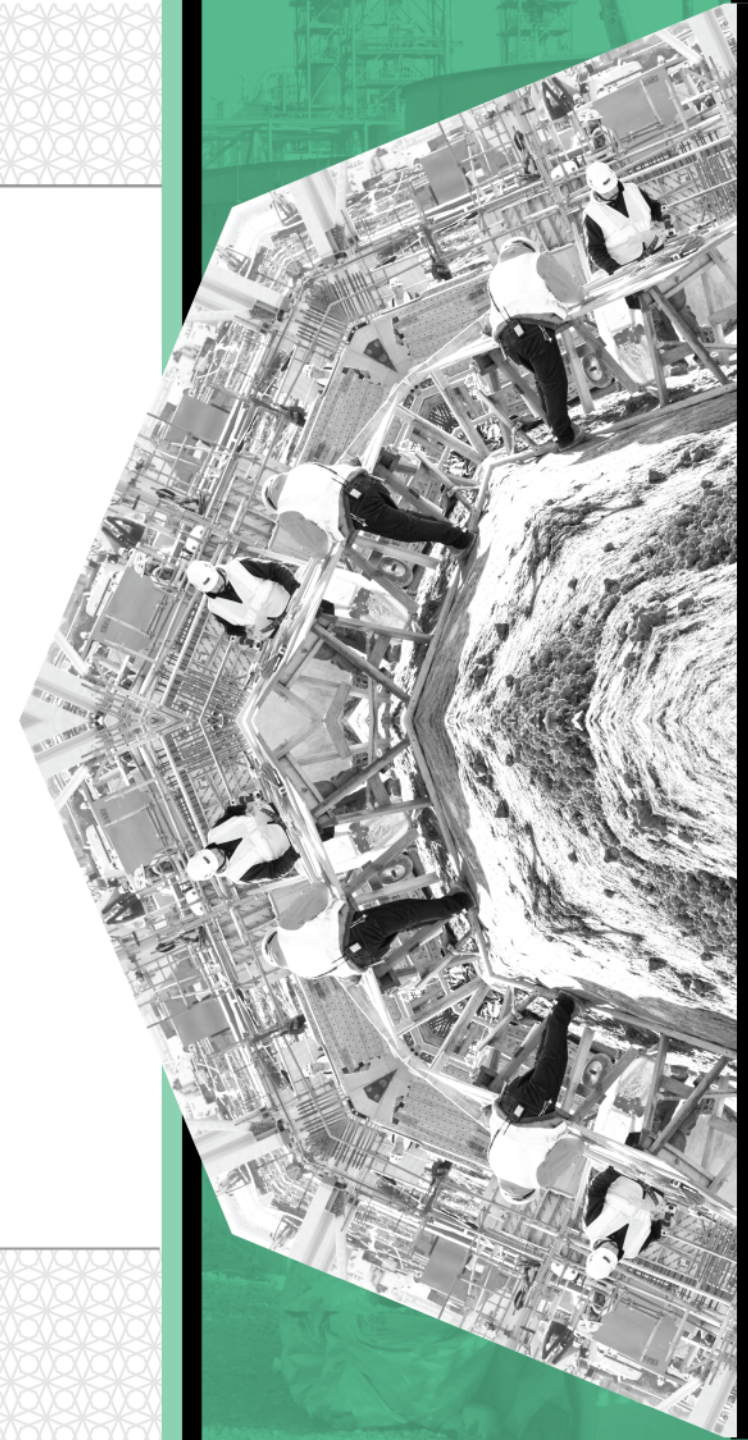
Moving AWP to the Next Level
Applying AWP Principles in Action and Expected Outcomes



Year:
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Sept 7

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Boca Raton, FL



Advanced Work Packaging – Moving to the Next Level

Facilitator



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Global Director of Advanced
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Workforce Planning



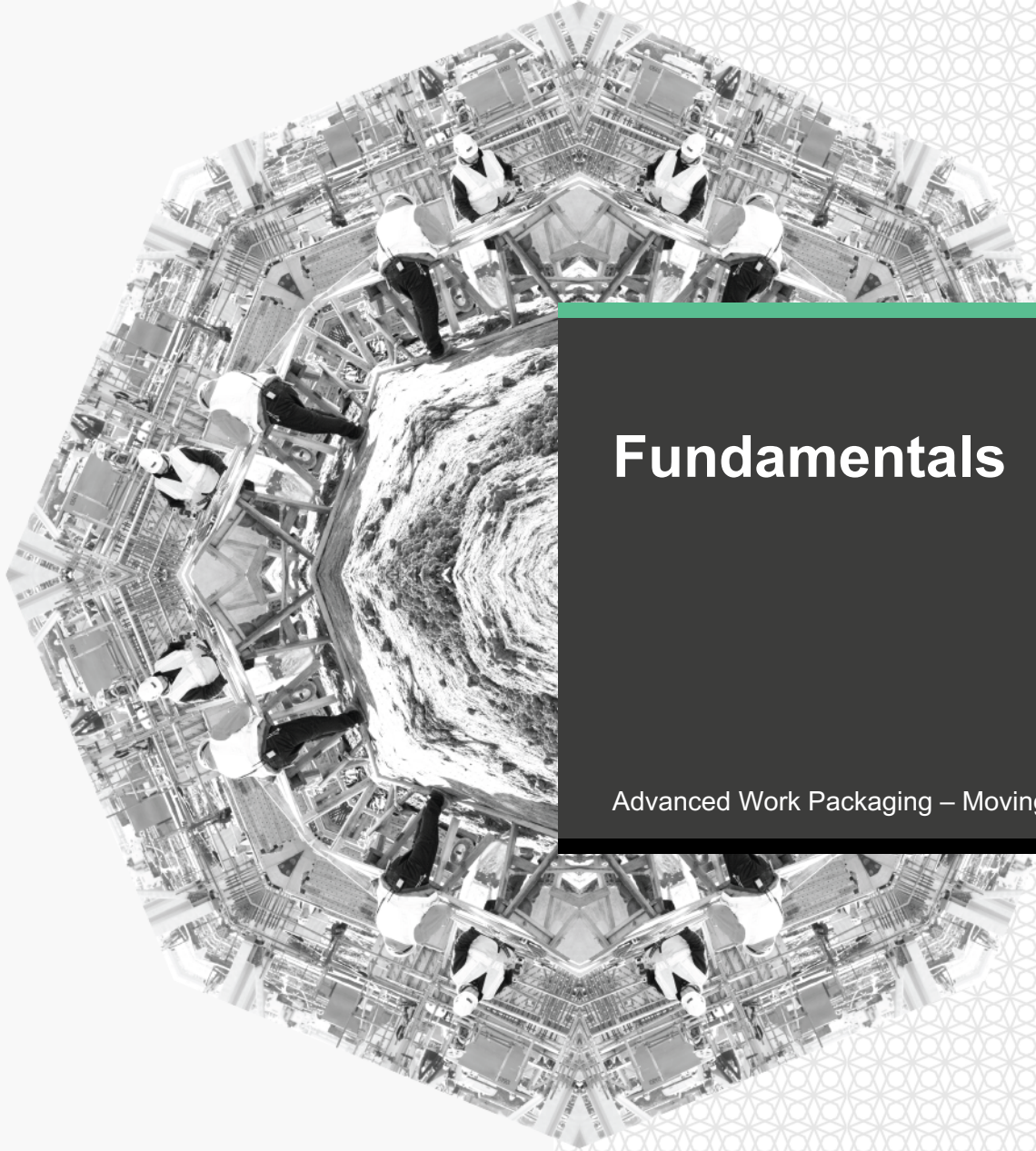
JACOBS®

Antonio Monteiro

Construction Manager

Objectives for today's session

- Share AWP fundamentals, definitions, and distinctiveness
- Discuss implementation between owner and contractor
- Review roadblocks and barriers for AWP
- Analyze results and statistics emerging from AWP implementation
- Identify your status and self reflection

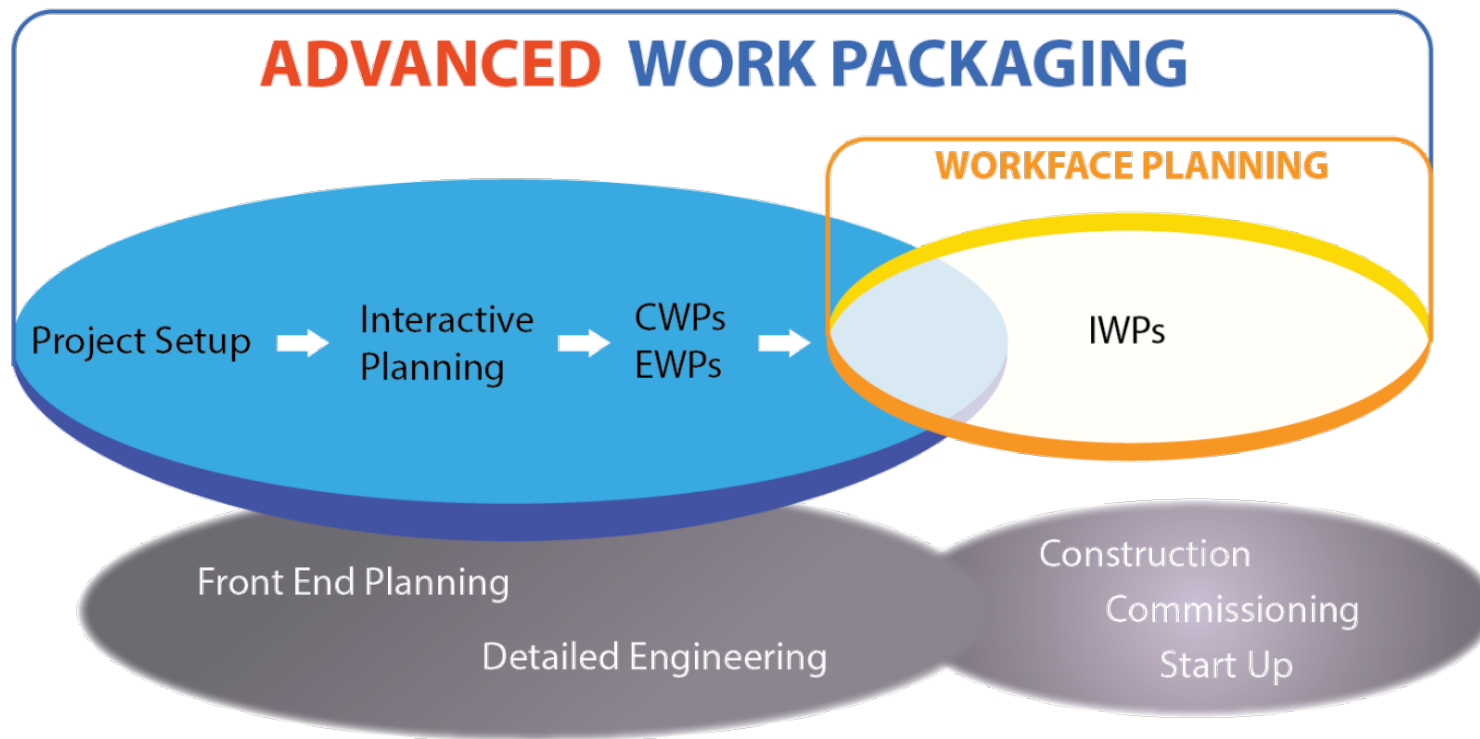


Fundamentals

Advanced Work Packaging – Moving to the Next Level

What is Advanced Work Packaging?

Advanced Work Packaging (AWP) is a disciplined approach to improve project productivity and predictability by aligning planning and execution activities from project setup to startup and turnover



Typical AWP sequence:

1. Determine path of construction
2. Develop CWP plan
3. Develop EWP plan
4. Complete EWP
5. Build CWP
6. Create IWP
7. Construction

CWP - Construction Work Package

EWP - Engineering Work Package

IWP - Installation Work Package

Source: CII IR272-2



Implementation

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Panel Question #1

Are owners and contractors truly and fully applying the principals of AWP, or only a few concepts?

Describe some effective implementation methods.

Implementation – Owner Perspective

- Management commitment / support
- AWP champions / leads
- AWP knowledge / education / training (materials, courses, conferences, etc.)
- Experience / maturity in fit-for-purpose application of AWP fundamentals
- AWP plan / staffing / organization
- Information management and automation / visualization tools integration
- Subcontractors / vendors engagement
- Path-of-construction and CWAs / CWP's / EWP's / PWP's

Implementation – Owner Perspective

- Workface planning / workface planners / IWPs
- Constraint management (materials, equipment, scaffolding, personnel, etc.)
- Controls / tracking / reporting
- Feedback loop and ongoing improvement
- Linking compensation to progress / completion of AWP deliverables
- Assessments

Implementation – Contractor Perspective

AWP STEP 1 – Defining the Voice of the Customers

- This step focuses on identifying the criteria that will serve as the prioritization parameters for the project. Key steps include:
 1. Understand the client and contractor business drivers.
 2. Define project scope and system completion and turnover requirements and priority.
 3. Identify long lead materials & equipment.
 4. Identify required specialty construction items (specialized critical lifts, logistic restrictions, etc.).
- Optimal Execution Timing: JSTEP – Phase 2: Conceptual Design

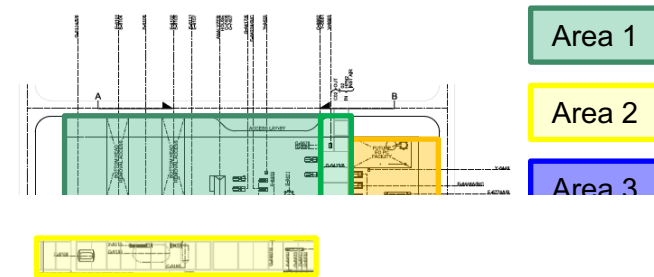


Implementation – Contractor Perspective

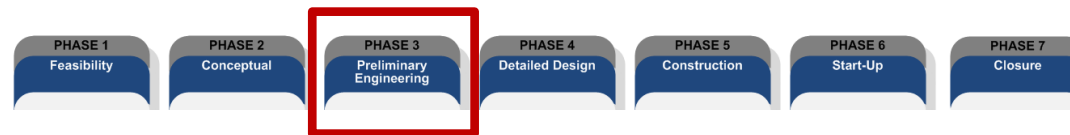
AWP STEP 2 – AWP Definition

- This step partitions the work scope into Engineering, Procurement, and Construction Work Packages. Key steps include:
 1. Define Construction Work Areas within the plot plan.
 2. Categorize Work Areas as modular or stick-built.
 3. Define Construction Work Packages (CWP), Engineering Work Packages (EWP), and Procurement Work Packages (PWP)
 4. Identify the priority sequences for CWPs, EWF and establish EPC Level 2 Schedule.

a 2



- Optimal Execution Timing: JSTEP – Phase 3: Preliminary Engineering



Implementation – Contractor Perspective

AWP STEP 3 – EWP and PWP Execution

- This step focuses on the execution and completion of the EWP's and PWP's. Key steps include:

1. Establish the EPC Level 3 Schedule detailing for work activities within each EWP, PWP, and CWP.
2. Support and track the execution of EWPs and PWPs.
3. Start developing the breakdown of CWPs into Field Installation Work Packages (FIWPs).

- Optimal Execution Timing: JSTEP – Phase 4: Detail Design



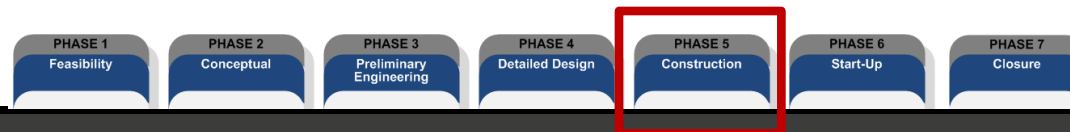
Implementation – Contractor Perspective

AWP STEP 4 – FIWP Execution

- This step focuses on the development, execution, and completion of FIWPs. Key steps include:

1. Develop FIWP's a minimum of 90 days before the associated CWP start date.
2. Progressively detail the construction Level 3 Schedule to a Level 4 detail identifying FIWPs execution within each CWP.
3. Support and track the execution of FIWPs.

- Optimal Execution Timing: JSTEP – Phase 5: Construction





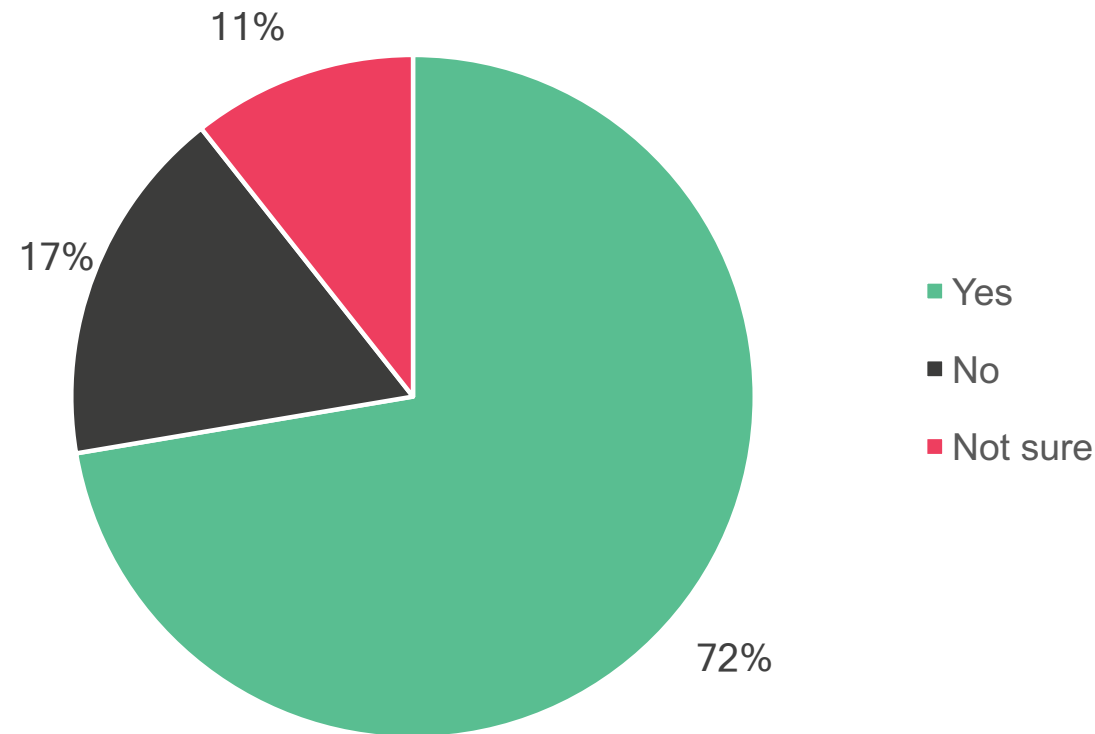
Roadblocks and Barriers

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AWP is generally seen as scalable for projects of all types and sizes...

Would you consider AWP to be a scalable process for all types and sizes of projects?

Percentage of respondents



Panel Question #2

And yet, AWP is not being as widely adopted as we might expect.

How can some of the roadblocks to implementing AWP be overcome?

Question #2 – EPC Perspective

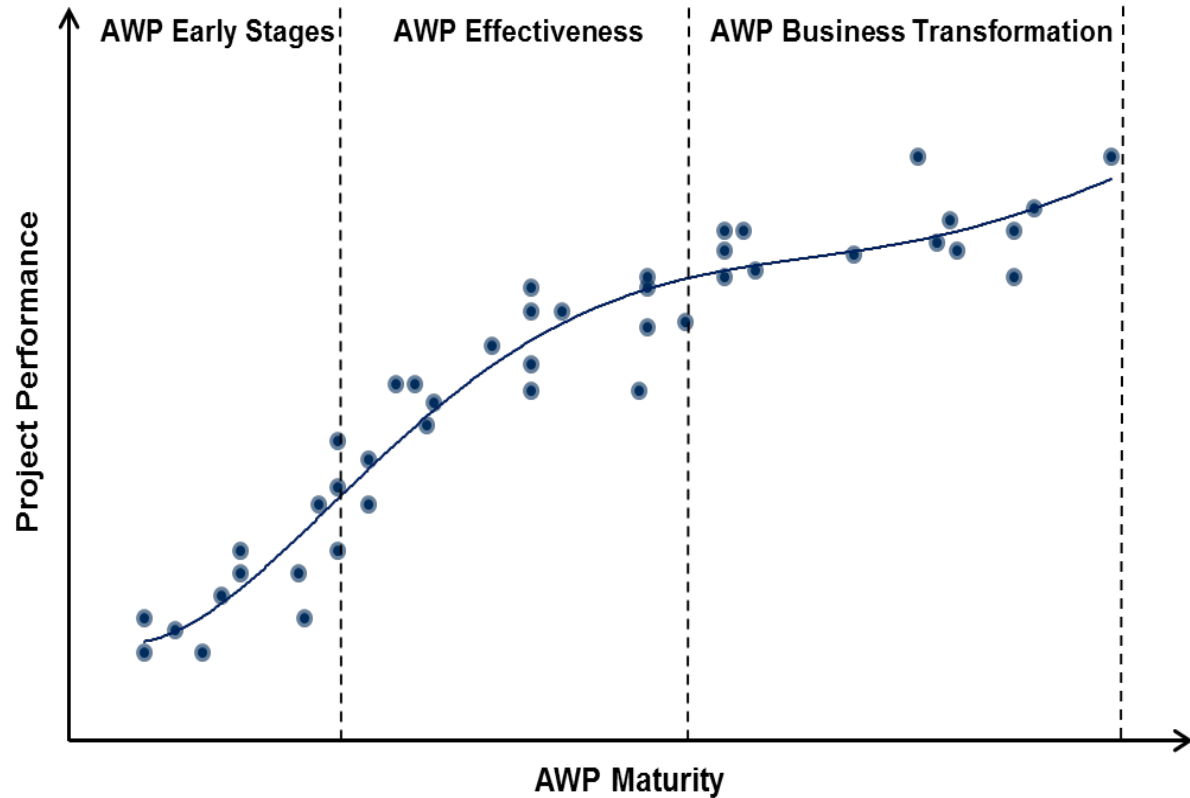
- Showcase the results of AWP from already complete or in-progress projects. Benchmark with similar projects.
- Gain support to implement AWP from owners' senior management by reviewing industry cases and results.
- Create a strong AWP culture and support within the EPCs for its implementation and execution, as well as engineering and procurement data standardization.



Results emerging from AWP

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Mature AWP implementation drives improved project performance



Performance Dimension	Maturity Stage		
	1 – AWP Early Stage	2 – AWP Effectiveness	3 – AWP Business Transformation
Productivity	↑ Around 10% improvement	↑ Around 25% improvement	→ Around 25% improvement
Cost	↑ Project on budget	↑ Around 10% below TIC	→ Around 10% below TIC
Safety	↑ 0 lost-time accident (TRIR below company average)	↑ 0 lost-time accident (sporadic first-aids and near misses)	→ 0 lost-time accident (sporadic first-aids and near misses)
Schedule	→ Project experienced minor delays	↑ Project slightly ahead of schedule during execution	→ Project slightly ahead of schedule during both planning and execution
Predictability	→ Not very satisfying (major changes to estimates)	→ Moderately positive (minor changes to estimates)	↑ Execution schedule to plan
Quality	→ In line with previous quality performance	→ Reworks slightly below company's average	↑ Rework substantially below company average + substantial reduction in RFIs

Source: CII IR319-2

Panel Question #3

How have you seen AWP positively impact projects that you have worked on?

Can this positive impact be consistently replicated on projects?

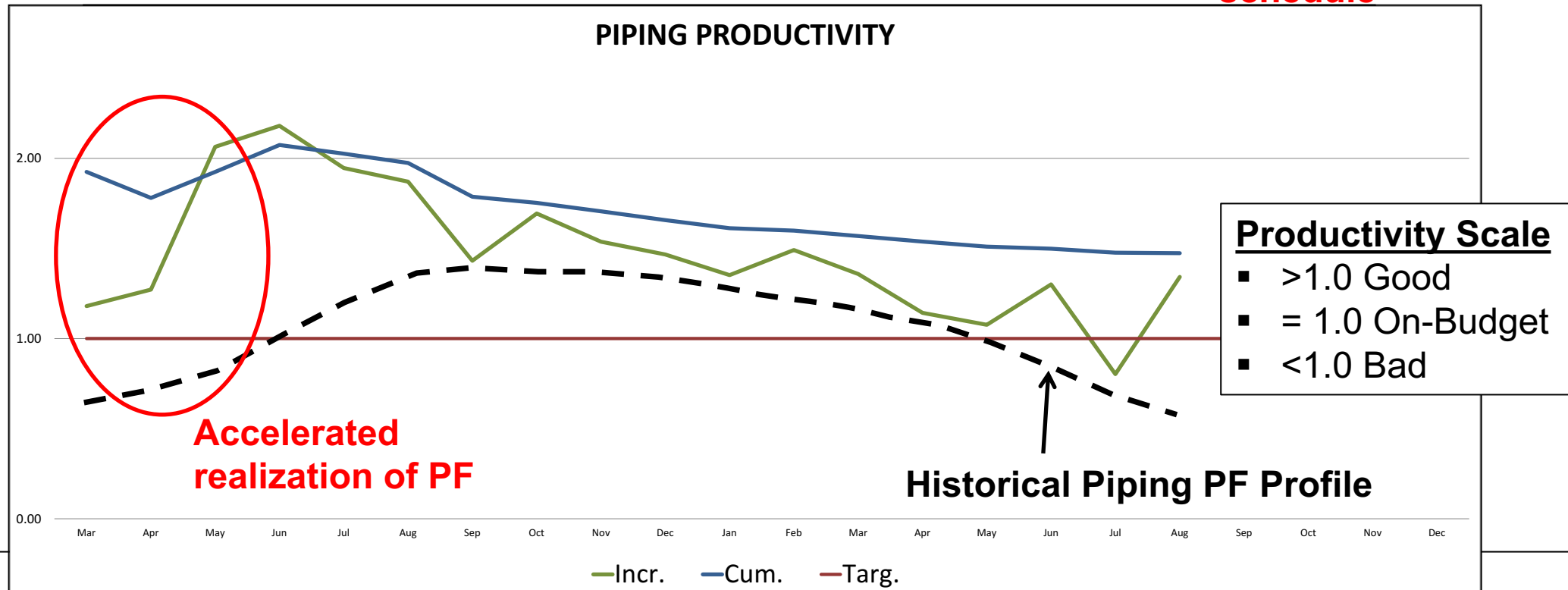
Results – Owner Perspective

- Construction sequencing supported with engineering deliverables alignment / packaging
- Timely managing of issues and preparing for safe / in-sequence construction
- Construction work packaging promoting alignment with bidders
- Disciplined approach to construction readiness – not mobilizing / starting work until ready

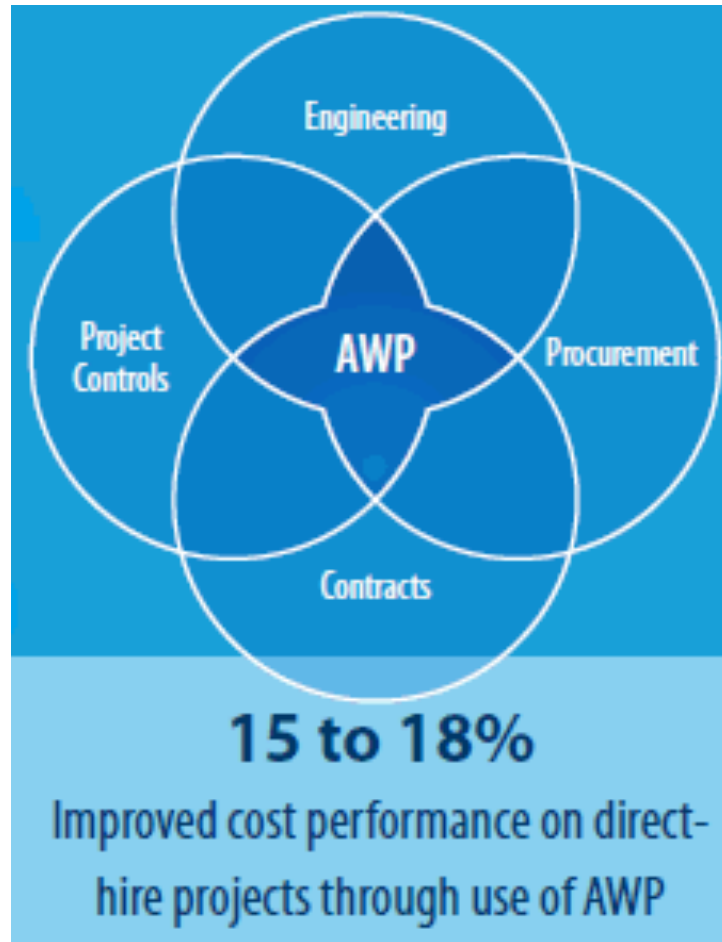
Results – Contractor Perspective

- Data from a completed EPC direct hire project
 - Partial AWP implementation in Engineering and Procurement phases
 - Full AWP implementation in Construction phase

**Completed project
3 months ahead of
schedule**



Results – EPC Perspective



These numbers are supported by bench marking developed by Fluor on current project implementation in different industries

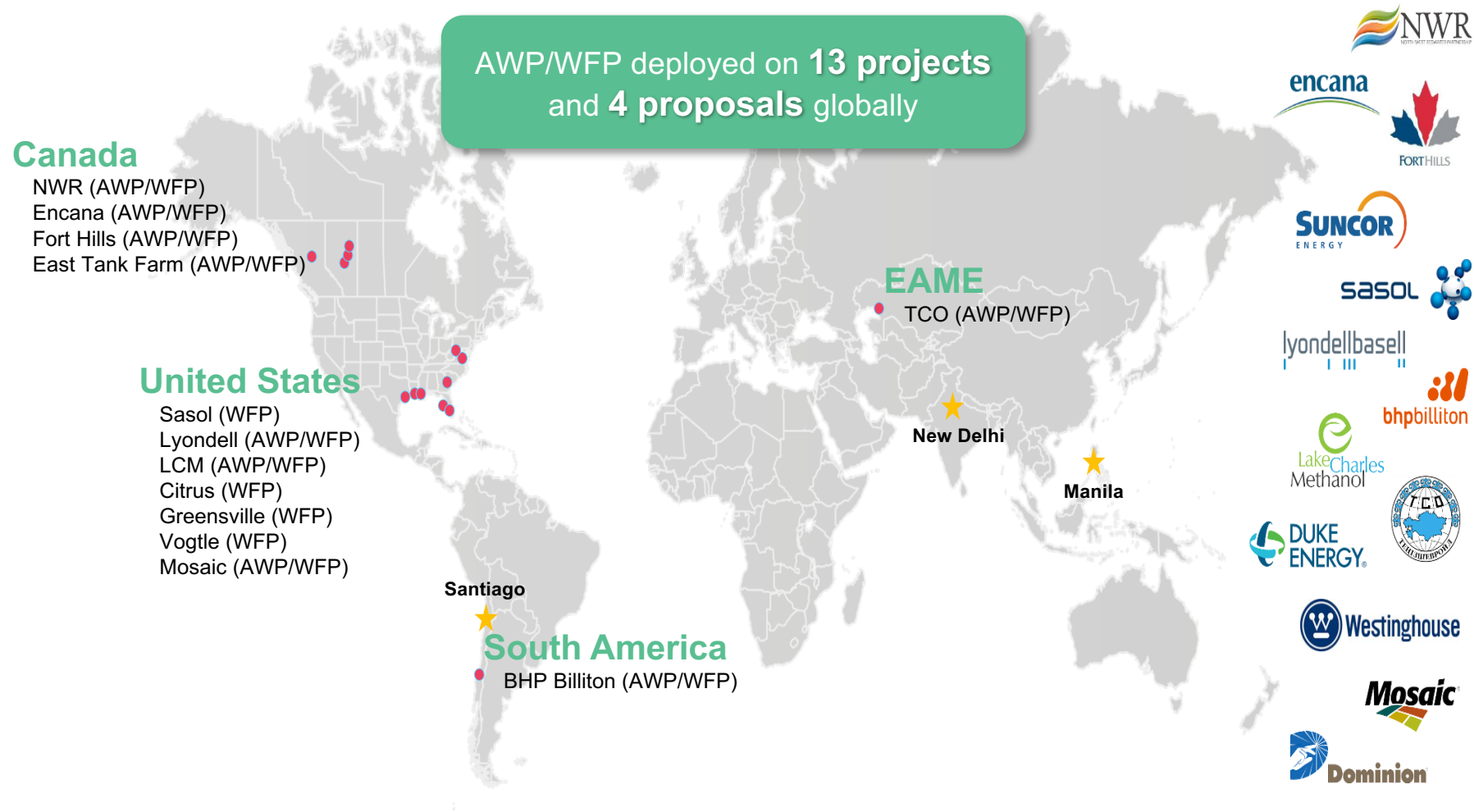
Did you know?

For **every hour spent** on AWP, we can **save ~20 hours** in the field

AWP has led to:

- Reduced HSE exposure hours
- Reduced project cost
- Increased productivity
- Schedule certainty
- Fewer expended labor hours
- Lower associated indirects

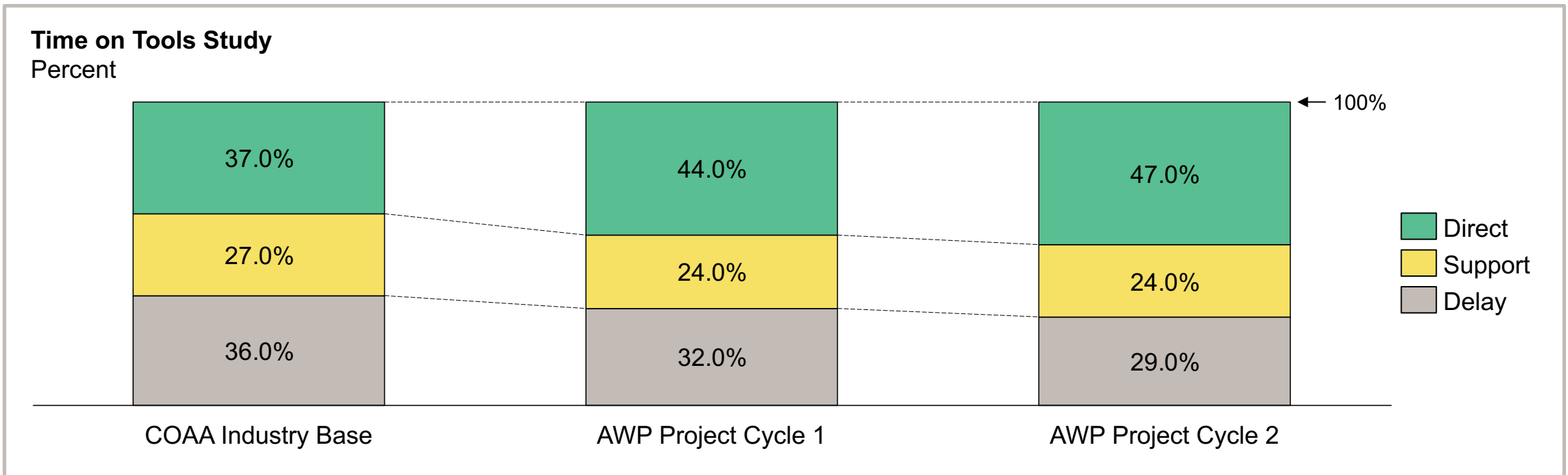
Implementation – Fluor AWP/WFP



Results – Overall Assessment

The following quote and results are from a report from a third party consultant hired by the owner for a major project in Alberta, Canada.

“The Fluor system for Workface Planning is mature, well developed and is compliant with the Clients procedures and intent. The creation of IWPs is having a significant positive impact in field level productivity”



Results

- The drivers behind AWP:
 - Design certainty
 - Materials certainty
 - Planned resources
 - Construction driven
- Results expected:
 - Improved productivity
 - Cost certainty
 - Schedule certainty
 - Reduced HSE exposure
 - Improved quality

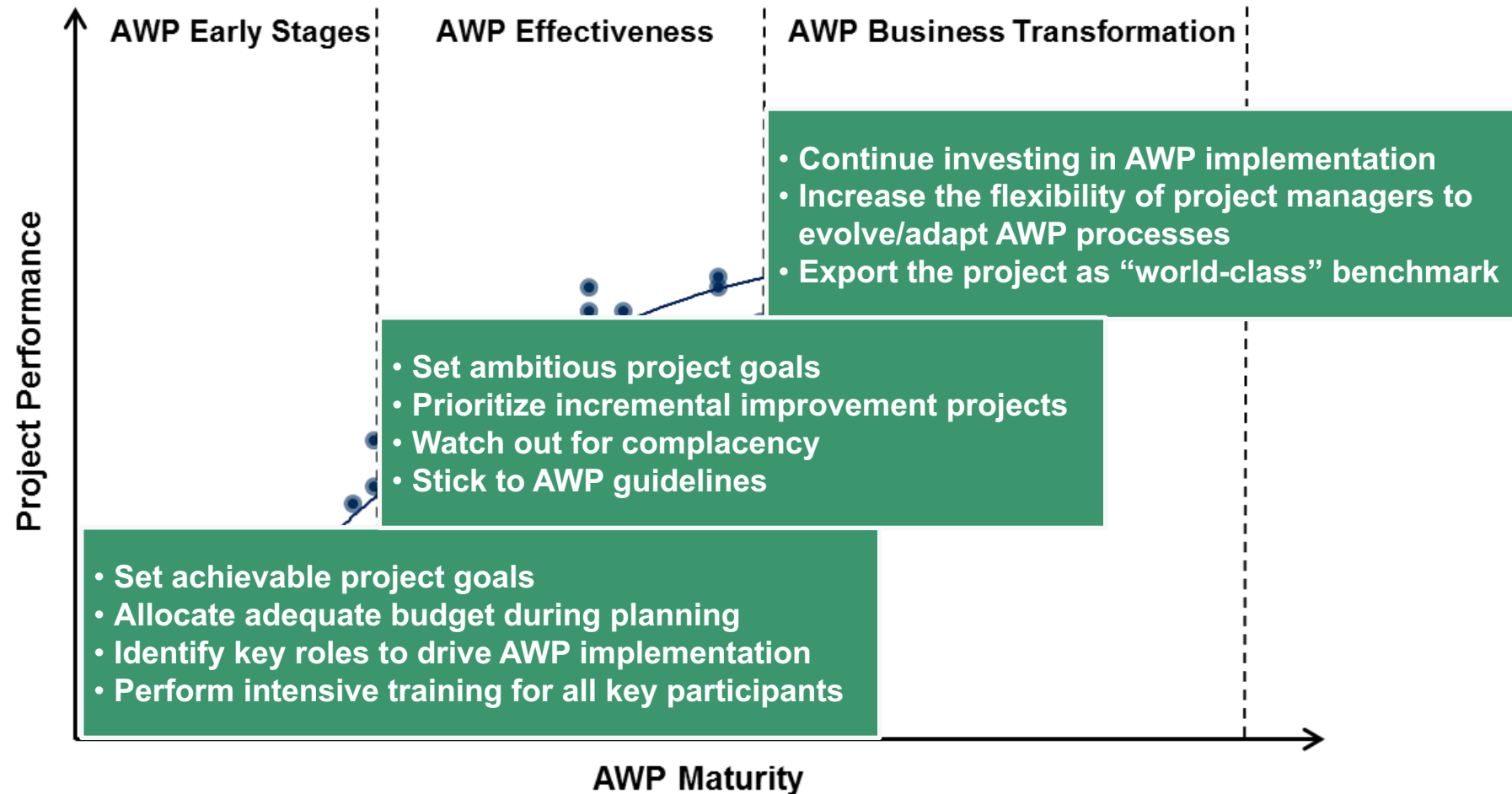




AWP begins with identification of self status

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Managers should adapt the organizational practices accordingly to the level of AWP maturity



Source: CII IR319-2

Questions from the audience



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End of Presentation

Thank You

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