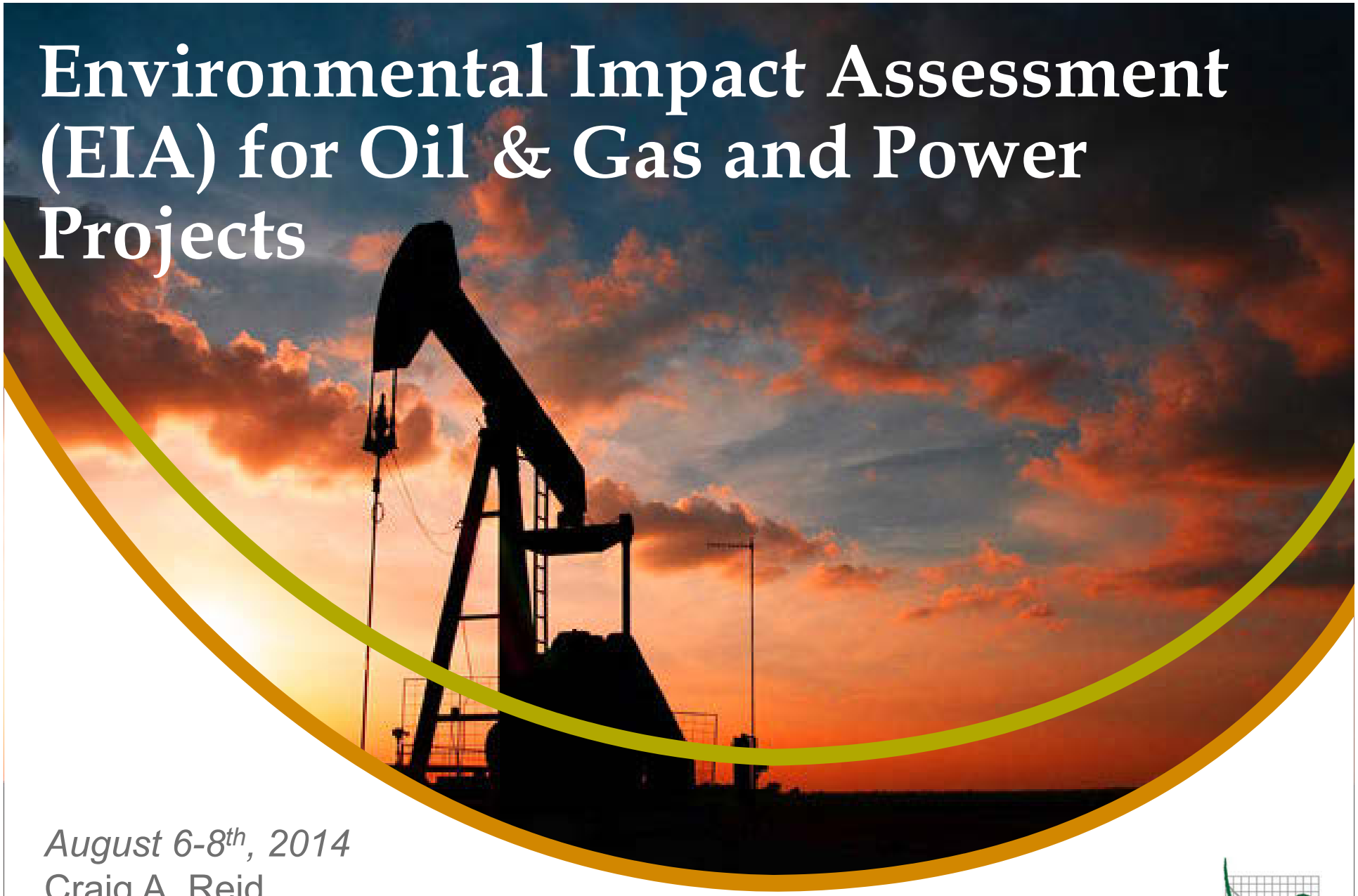
Environmental Impact Assessment (EIA) for Oil & Gas and Power Projects



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Agenda

- What is an Environmental Impact Assessment (EIA)
- A typical EIA process
- Key EIA issues for O&G and Power
- The emerging Myanmar EIA process and procedures

What is an EIA

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What is an EIA?

- EIA is commonly a legal procedure in which a project developer is required to provide environmental information to a consenting body so that this information can be used for better informed decision making.
- Usually also involves publication and public comment / disclosure (consultation)
- This information is usually provided in an EIA Report (also called Environmental Impact Statement (EIS), Environmental Social (Health) Impact Assessment (ES(H)IA) etc).
- EIA procedures vary widely from one jurisdiction to another.

Objectives of an EIA

- *An Environmental Impact Assessment (EIA) is...*
  - A tool to identify potential environmental impacts of a proposed project, assess how significant (important) these impacts are and recommend appropriate mitigation, management and monitoring measures to prevent or reduce impacts to acceptable levels
- EIA is a process and a tool to aid decision-making
- Information gathered during an EIA can feedback into project design
- EIA outcomes are typically used to manage subsequent phases of project design, construction and operation

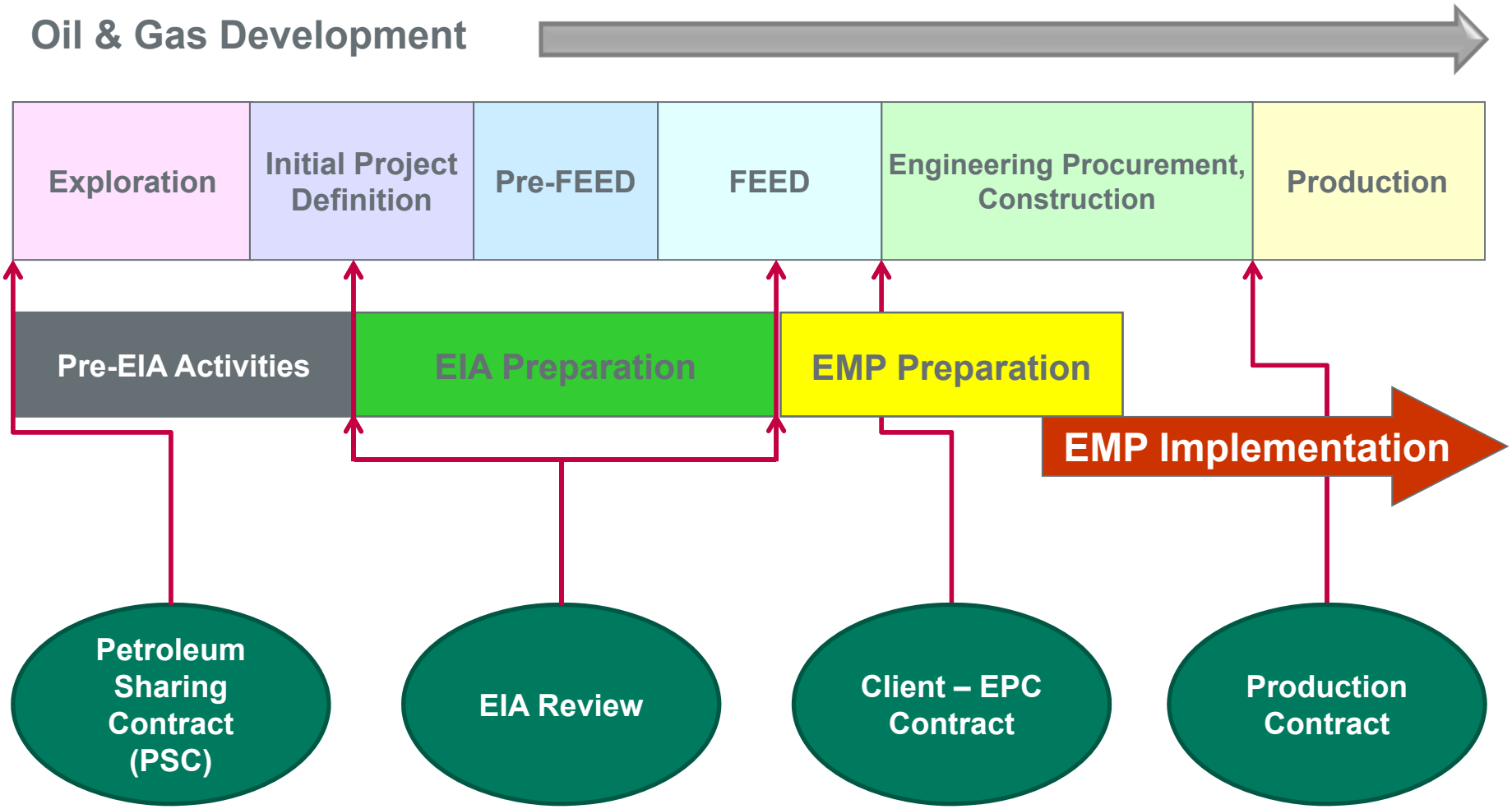
Environmental Impact Assessment (EIA)

- Drivers for an EIA:
  - Regulatory
  - Industry / Corporate
  - Financing
- Context of an EIA:
  - Standards
  - Policies
- Scope of an EIA:
  - Environment
  - Social
  - Health
  - Safety

Standards Used in an EIA

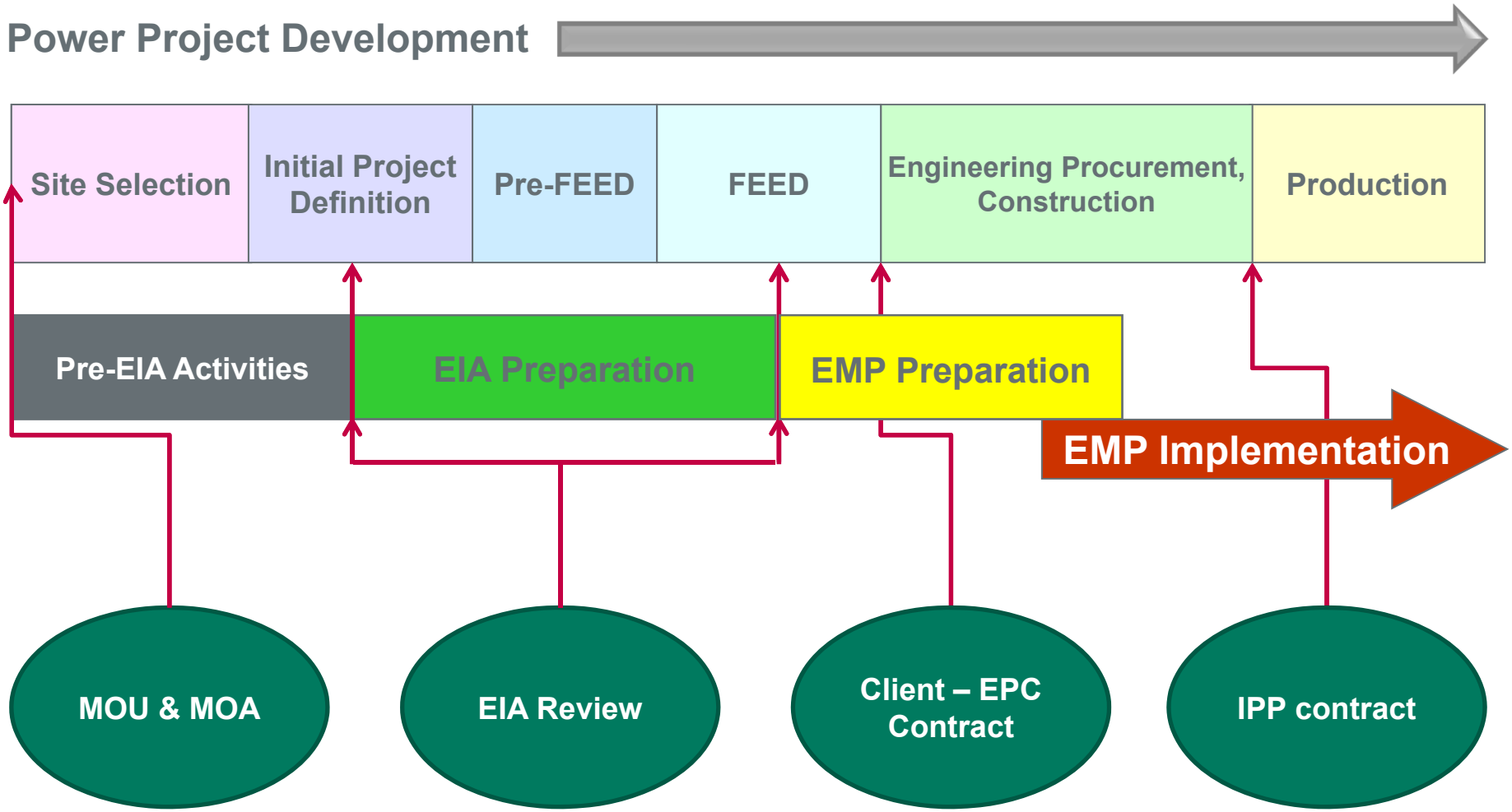
- Prescriptive vs. Guidelines
- Performance Standards e.g:
  - “end of pipe” concentration
  - environmental quality standards
  - safety performance
- Design Standards e.g.:
  - Good International Industry Practice (GIIP)
  - Well control and safety systems
  - design tolerances - e.g. 1 in 100 year wind and waves
- ‘Procedural’ Standards (e.g. EIA, monitoring, options selection)

EIA Timing in O&G Projects



Contracts and Review Stages

EIA Timing in Power Projects



Contracts and Review Stages

A Typical EIA Process

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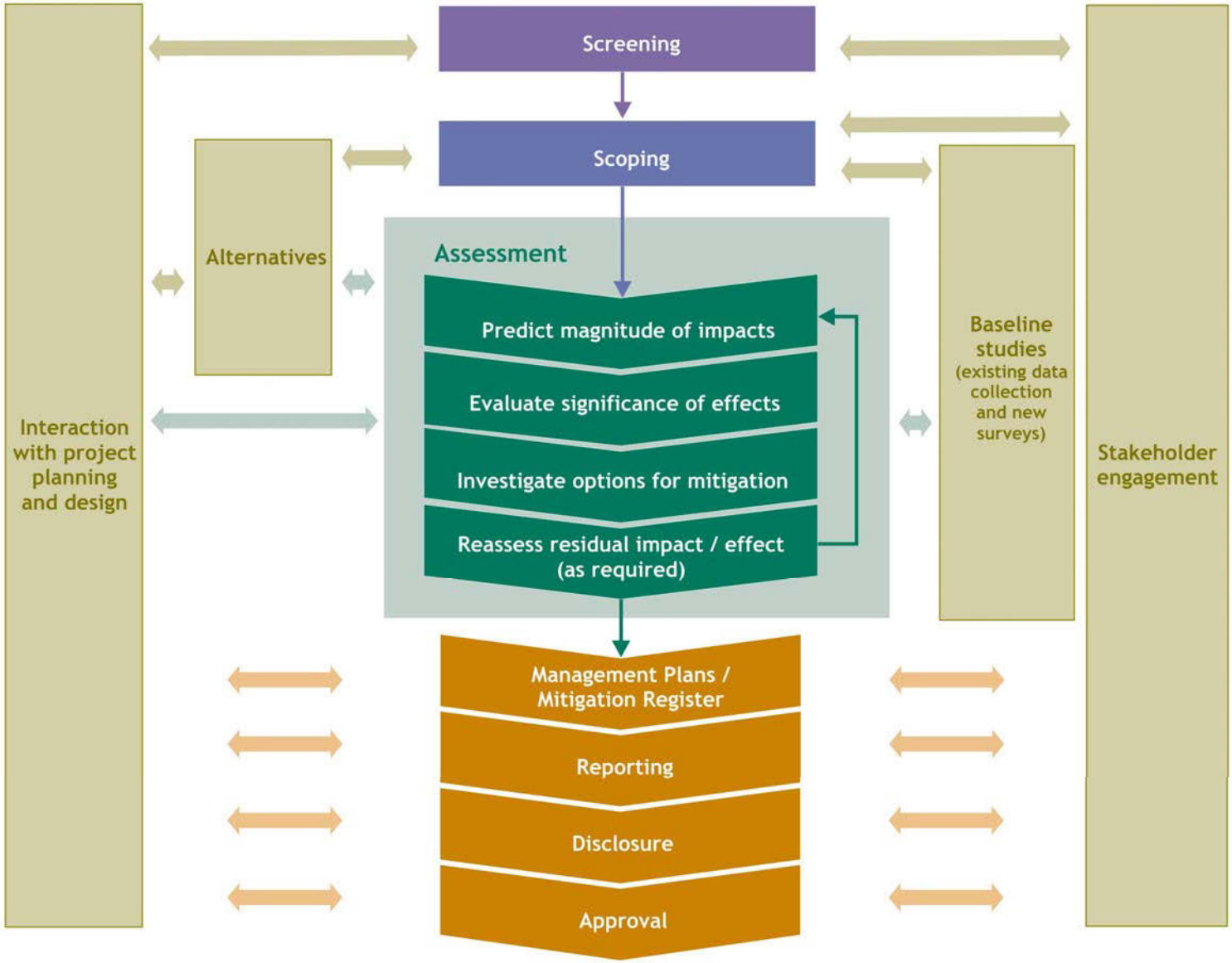
General EIA Process



Screening

- Primary objective is to identify what requirements apply to the Project
- Formal activity could be undertaken by Project Proponent, the lender or the regulator depending on the project and jurisdiction
- Good project planning:
  - understand the project: what do we need to do – project definition, environment, impacts, alternatives
  - when – programme
  - how – methods
  - who – expertise needed
  - who do we need to talk to – consultation and Stakeholder Mapping

Scoping

- Ensures that the EIA focuses on:
  - The most important impacts
  - Appropriate alternatives
- Defines the EIA "scope" in terms of:
  - Adequacy of baseline data
  - Coverage, focus and methodology for impact assessment
- Defines the Project's "Area of Influence"
- Also importantly identifies issues that are ***beyond the scope*** and rationale for exclusion

Scoping Tools and Methods

- Potential 'interactions' between project activities and baseline are mapped.
  - What effects could the project have on the environment or people?
  - Which of these effects are likely to be significant?
  - Which alternatives and mitigating measures should be considered?
- Impact Matrix – identify potential impacts:
  1. an interaction is reasonably expected;
  2. an interaction is possible but none of the resulting impacts are likely to lead to significant effects; and
  3. the interaction is reasonably possible and at least on of the resulting impacts is likely to lead to an effect that is significant.

Establish Baseline

- Why collect baseline data
  - identify and describe aspects of environment that may be affected
  - provide data needed for predictions
  - inform judgments about significance
  - Desk research and field work
- Important to focus on relevant information

Why Predict Impacts?

Decision makers are not experts - they need to understand what we are telling them when we describe an impact; to understand how important the predicted impact is so that they can give it the right weight in their decision.

Predicting Impacts

- Describing what will be affected (from the baseline)
  - and how …. the nature of the change
  - The size of the change (how much - mg/m^3; ha; % of population)
  - its geographical extent and distribution (where, how far)
  - its timing and duration (when, how long for, how often)
  - the probability and consequences (“risk”) of unplanned / non-routine events (accidents, natural disasters etc) occurring
  - the likelihood of uncertain effects (impacts where we don’t know / are not sure) occurring
  - assumptions and limitations and any resulting uncertainty about the prediction (ranges, +/- x%, confidence limits)

Approaches to Predicting Impacts

- Use standards and norms as the starting point for evaluation where available:
  - Does it cause legal or accepted environmental standards to be exceeded – e.g. air, water or soil quality, noise levels – or make a substantial contribution to the likelihood of exceedence
  - Does it adversely affect protected areas or features, or valuable resources – nature conservation areas, rare or protected species, protected landscapes, historic features, high quality agricultural land, important sources of water supply
  - Does it conflict with established government policy e.g. to reduce CO_2 emissions, recycle waste, regenerate deprived urban areas, protect human rights

Is it enough?

- The decision-maker needs to know more than just “Is it significant?”
  - They need to know how much weight to give to the impact in making the decision
  - How important it is to impose conditions to control the impact?
- Breach of a mandatory standard is illegal
  - So what about impacts that don’t reach that level
  - Are they still significant? How significant?
  - What about non-statutory guidelines?
- The EIA must present a judgment about the significance of impacts
- Essential to explain how significance is evaluated, i.e. evaluation criteria
- Where there are no standards a good approach is to consider the magnitude of the impact and the value or sensitivity of the affected resource or receptor

Predicting Impacts

- Impact Type
  - Direct, secondary, indirect, cumulative or residual
- Impact Magnitude
- Impact Nature
  - Negative, positive or neutral
- Impact Duration
  - Temporary, short-term, long-term or permanent
- Impact Extent
  - Local, regional or global
- Impact prediction takes into account any mitigation or control measures that are part of the Project design.
- Additional mitigation measures aimed at further reducing predicted impacts are proposed where necessary or appropriate.

Mitigation, Management and Monitoring

- Eliminate or otherwise minimise adverse impacts
- As Low As Reasonably Practical (ALARP)
- Consultation can play a major role in defining appropriate measures
- Mature industry has developed best practice guidance for most routine E&P operations
- New frontiers mean new challenges
- Integrated management systems cover environment, social, health and safety
- Commitments and obligations arise from EIA process
- Roles and responsibilities or putting commitments into action
- Verification – audit and inspection
- Monitoring to ensure effectiveness of mitigation and to manage change

Key Issues in the O&G Sector

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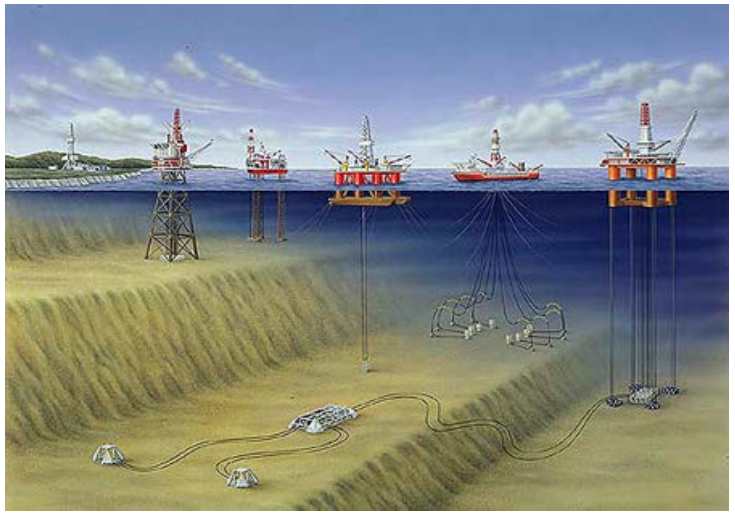
The E&P Lifecycle

- Feasibility and due diligence
- Seismic exploration
- Exploration drilling and appraisal
- Field development
- Abandonment and decommissioning



Seismic Exploration

- Offshore
  - Underwater noise
  - Vessel emissions, wastes etc
  - Airborne noise
  - Light
  - Physical disturbance of seabed
  - Shipping / navigation / fishing
  - Non-routine events
- Onshore
  - Land clearance
  - Noise
  - Light
  - Waste Management
  - Workers camps

Exploration / Production Drilling

- Rig positioning
- Impacts from mud and cuttings
- Flaring
- Rig emissions, wastes etc
- Presence of the rig
- Social Impacts

Key Issues in the Power Sector

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Air Quality and GHG Emissions

RC1

- Emphasis in local regulations on NOx, SOx, PM10 control measures
- Gaps between many local regulations in APAC and international guidelines
- Cumulative impacts on air quality often overlooked at the local level – presents problems when Ground Level Concentrations cannot be achieved in power complexes – particularly in degraded air sheds
- Local regulations rarely require assessments focused on energy efficiency and GHG reduction/management in contrast with international practice

Slide 27

RC1 Kary - do we have any more images of stacks/ chimneys on our image library?
Rachel Conti, 30-Oct-2013

Air Quality and GHG Emissions

RC2

- International guidance recommends consideration of:
  - Alternative project locations
  - Use of less carbon intensive fuels
  - Use combined heat and power plants
  - Use of higher conversion efficient technology
  - Careful consideration of sub vs supercritical technology
  - High levels of monitoring, process control and maintenance
  - Examine feasibility of emission offsets (reforestation, afforestation, CCS – siting constraints

Slide 28

RC2 Kary - do we have any more images of stacks/ chimneys on our image library?
Rachel Conti, 30-Oct-2013

Biodiversity

- Many power generating facilities can involve large amount of land take and physical habitat alteration
- Changes to habitats can effect biodiversity resources
- Power plants often require significant water resources and extract water from local water bodies
- Discharges from power plants can include significantly heated water

Myanmar's Emerging EIA Process

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EIAs allows questions to be asked…

- Should the project gain regulatory approval?
- What are the potential environmental impacts related to the project and are they being addressed / managed?
- Who are the stakeholders and are they being consulted?
- Will there be any social / health impacts resulting from the project are they being addressed / managed?
- Will this project damage the Proponent's or the Government's reputation?
- If money is being sought for the project, are the EHS requirements of those institutions being met?
- Are there any safety / risks-to-life for the project and are they being addressed?
- What are the risks to closure / decommissioning of facilities?

Expectations are Increasing

- Public expectations are high
- New challenges in an emerging / frontier market
- Issues that are of increasing importance include:
  - Social issues
  - Resettlement and Land acquisition
  - Managing sensitive habitats and the peoples that depend on them
  - Managing Biodiversity Impacts
  - Health related issues
  - Climate change related issues
  - Cumulative impacts

Myanmar EIA Process

- Different developments will carry specific EHSS issues
- All stages of the project (before construction, during construction and when the project is operational) should be assessed – at the right time
- Best to identify significant issues early on
- Good planning minimises indirect and unplanned environmental and safety impacts
- Understanding the project EHSS risks are important to the success of the project
- Early review and assessment of EHSS risks will increase the likelihood of successes for all stakeholders
- Continual Monitoring, Management and Disclosure are essential

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