

# Project Development & Finance



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**Renewable Energy for  
Tribal Community  
Development**

# Overview

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- Project Development & Finance Section
- Focus on the process discipline, practice and advisory
- Not focused on any one technology
- Often engage with government clients/communities seeking to understand and then develop RE opportunities

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# Project Development & Finance



Who?!

Me?

Or? Hey *that doesn't make sense!*

*YOUR FAULT*  
Project Development  
Finance?

And

&

Project  
~~FINANCE~~

WHEN?!

“and then”



**Finance**

# Grounding in Commercial Practices



## Project Screening

All projects benefit from the development framework and situation awareness provided by the SROPTTC framework.

## Underwriting Skills

PD&F staff apply pro formas and checklists to feasibility analysis of projects, exploring credibility and identifying risks.

### Project Pro Formas

Template pro forma spreadsheets are being developed for four RE technologies initially, expanding to eight. They capture the economic potential of a project.

### Project Development Checklists

Template development checklists are being developed for each of the technology-specific pro formas. They detail a systematic process for developing key inputs and screening projects for fatal flaws or strategic issues.



## Results

Enhanced pace and impact of our deployment engagements across the variety of EE/RE technologies, enabled by the broadly applicable project screening and underwriting skills of our staff.

# NREL Team Capacity Snapshot

## 19 Staff in PD&F

### Alt. Finance



### Project Development & Finance

18 Full Time Staff/over 60 in support

9 MBA's

18 Engineers

### Private Sector Project Experience

Over \$1B in Alternative Finance

Over \$14B in Treasury 1603

Due Diligence – over \$10B

Project Finance – over \$250M raised

Wind

Solar

Geothermal

Biomass

Water

Hydrogen

### NREL Technical Programs

Fundamental and Applied Science

Technical Depth

## Bob Springer Bio

With over 17 years of professional experience, Bob has led technical and project development teams involved with implementation of over \$500 million of project value. Most recently, Bob was an active project developer leading the development and financing of over \$65 million of project value, and has conducted financial underwriting and feasibility for over \$1 billion of project value over his career.

At NREL, as a Senior Project Leader, Bob has a leadership role bringing together technical and financial solutions to support project deployment in renewable energy projects around the world. Bob holds a B.S. in Civil Engineering from the University of Iowa, is a Registered Professional Engineer (inactive) in Colorado, and holds an MBA in Finance, with Honors, from Vanderbilt University.

# Overview of Process Key Concepts

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- Project Motivation – Establish commitment for investment
  - Supported by BEPTC framework
  - Equivalent to private sector market analysis
  - Motivates investment of resources
- Project Development Process - Manage development risk
  - Acknowledge commercial practice/leverage lessons
  - Overall process environment – situational awareness
  - Framework of information management – SROPTTC
  - Process of incremental investment seeking fatal flaws – Risk Management
  - Tools: Pro Formas and Project Checklists



# Project Motivation – Concept Definition

Baseline: what drives you to do this?

Economics: fundamental energy economics

Policy: create conditions for success

Technology: what, when, where, how many?

Consensus: establish, advance, defend

Establish and communicate motivation using this framework

**Generates initial commitment of key resources.**

# BEPTC Description - NREL

Baseline	Economics	Policy	Technology	Consensus
Baseline Driver to alter energy source	Fundamental drivers	Conditions for success	What, when, how many,	Defend, defend, defend...
<ul style="list-style-type: none"> <li>• define energy</li> <li>• unit of measure</li> <li>• point of measurement</li> <li>• source of fuel</li> <li>• vulnerabilities</li> <li>• impact to economy</li> <li>• industry structure</li> <li>• regulatory structure</li> <li>• how does our system work?</li> </ul>	<ul style="list-style-type: none"> <li>• Dominant input to energy economics</li> <li>• equation-relationship b/tween inputs and results</li> <li>• ratepayer's perspective, or social cost/benefit</li> <li>• we don't have the money....present value</li> <li>• Cost AND benefit</li> </ul>	<ul style="list-style-type: none"> <li>• market policies (RPS)</li> <li>• utility regulatory policy</li> <li>• economic development</li> <li>• jobs</li> <li>• energy security</li> <li>• environmental policy</li> </ul>	<ul style="list-style-type: none"> <li>• what is real</li> <li>• what is experiment</li> <li>• which one for my system/location?</li> <li>• how much is here</li> <li>• how much can be used ?</li> <li>• integration/reliability</li> <li>• will it work</li> </ul>	<ul style="list-style-type: none"> <li>• communicate</li> <li>• create a forum</li> <li>• defend fundamentals</li> <li>• build consensus</li> <li>• raise the level of conversation</li> <li>• lather, rinse, repeat</li> </ul>

# Project Development Process - SROPTTC

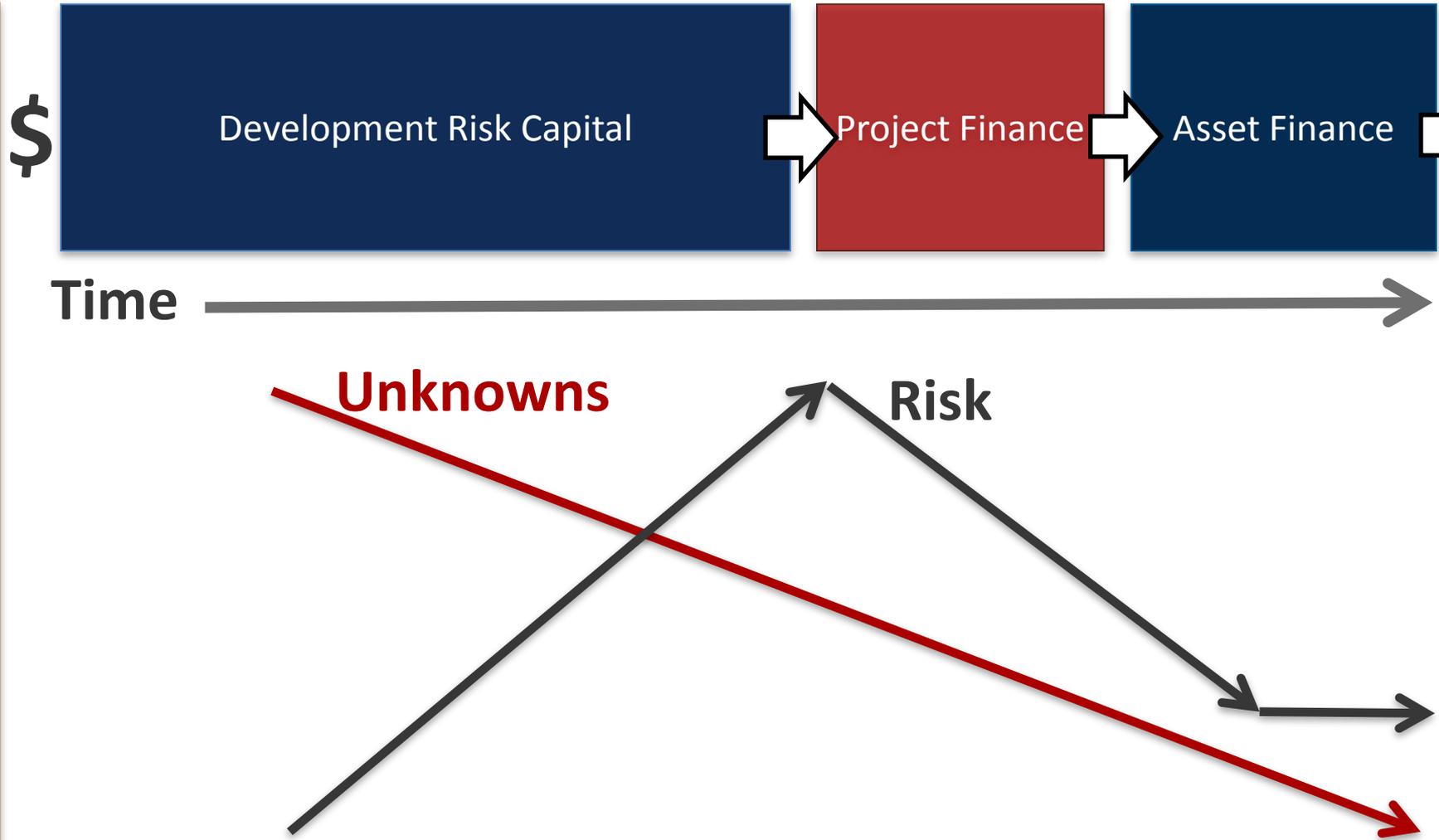
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Overall framework and process developed at NREL:

- Project Development Environment
- Framework for information - SROPTTC
- Process – incremental investment and fatal flaw analysis to manage development risk
- Tools – Pro Formas and Checklists

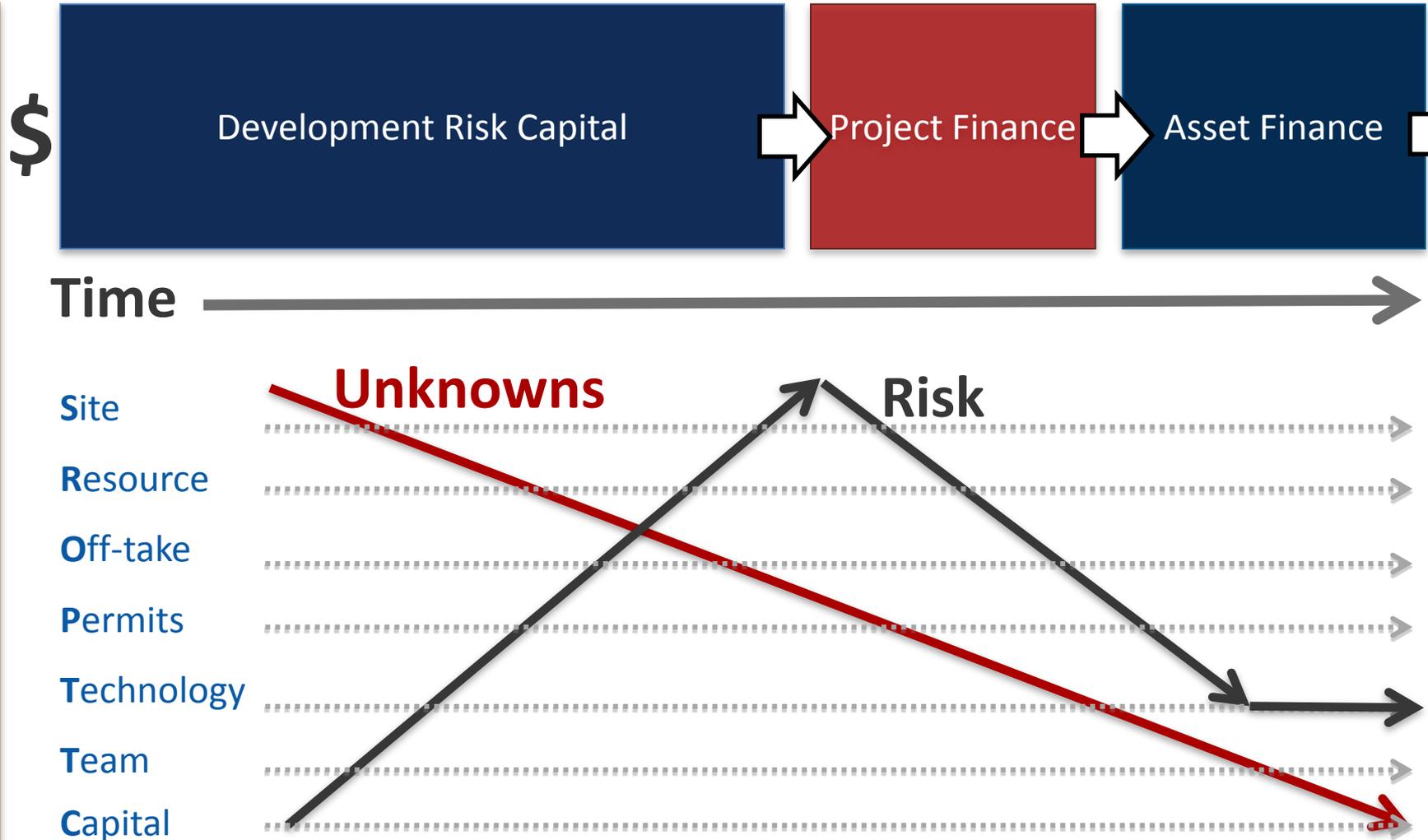
# Project Development Environment

Project Motivation – Using BEPTC Framework



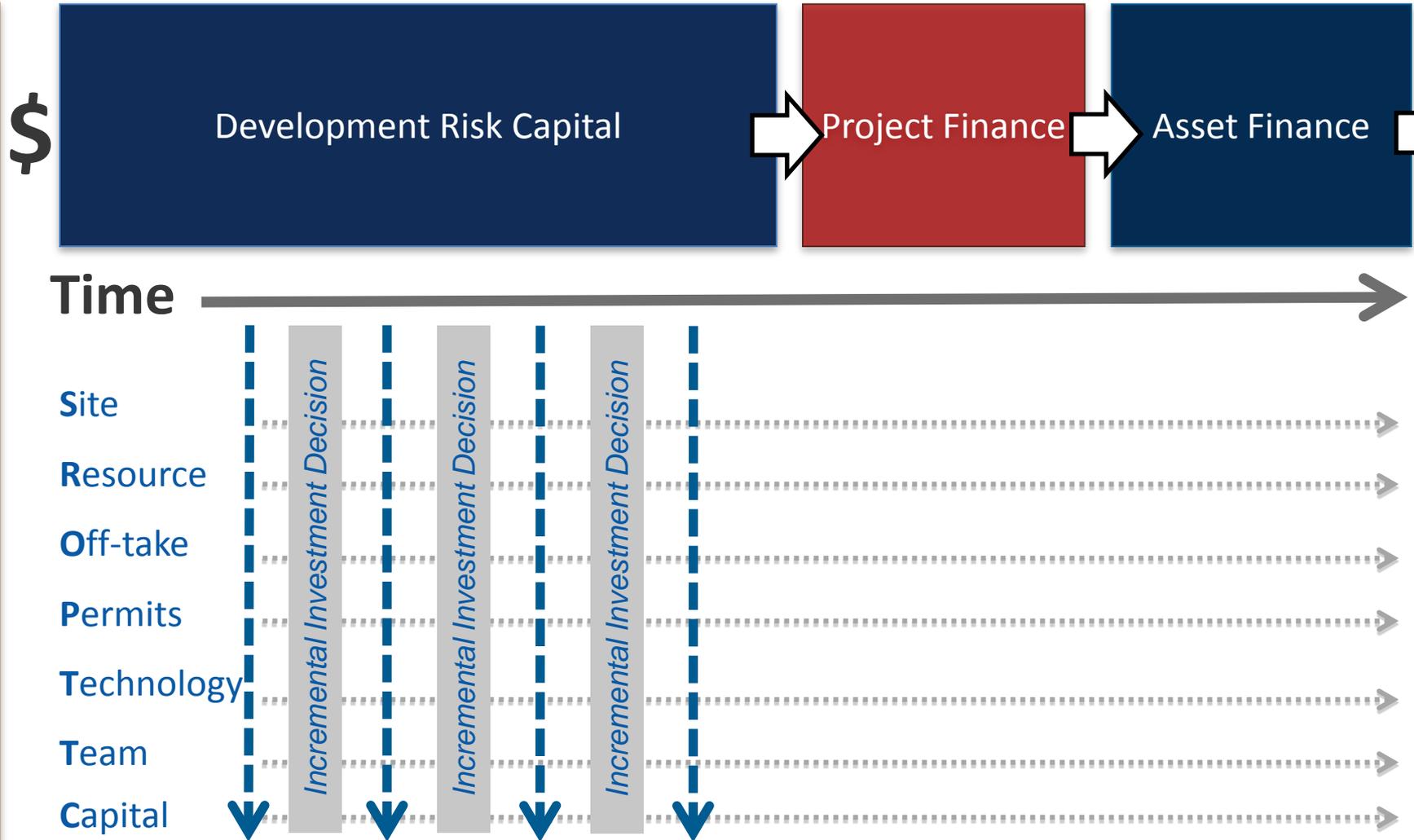
# SROPTTC Framework

Project Motivation – Using BEPTC Framework



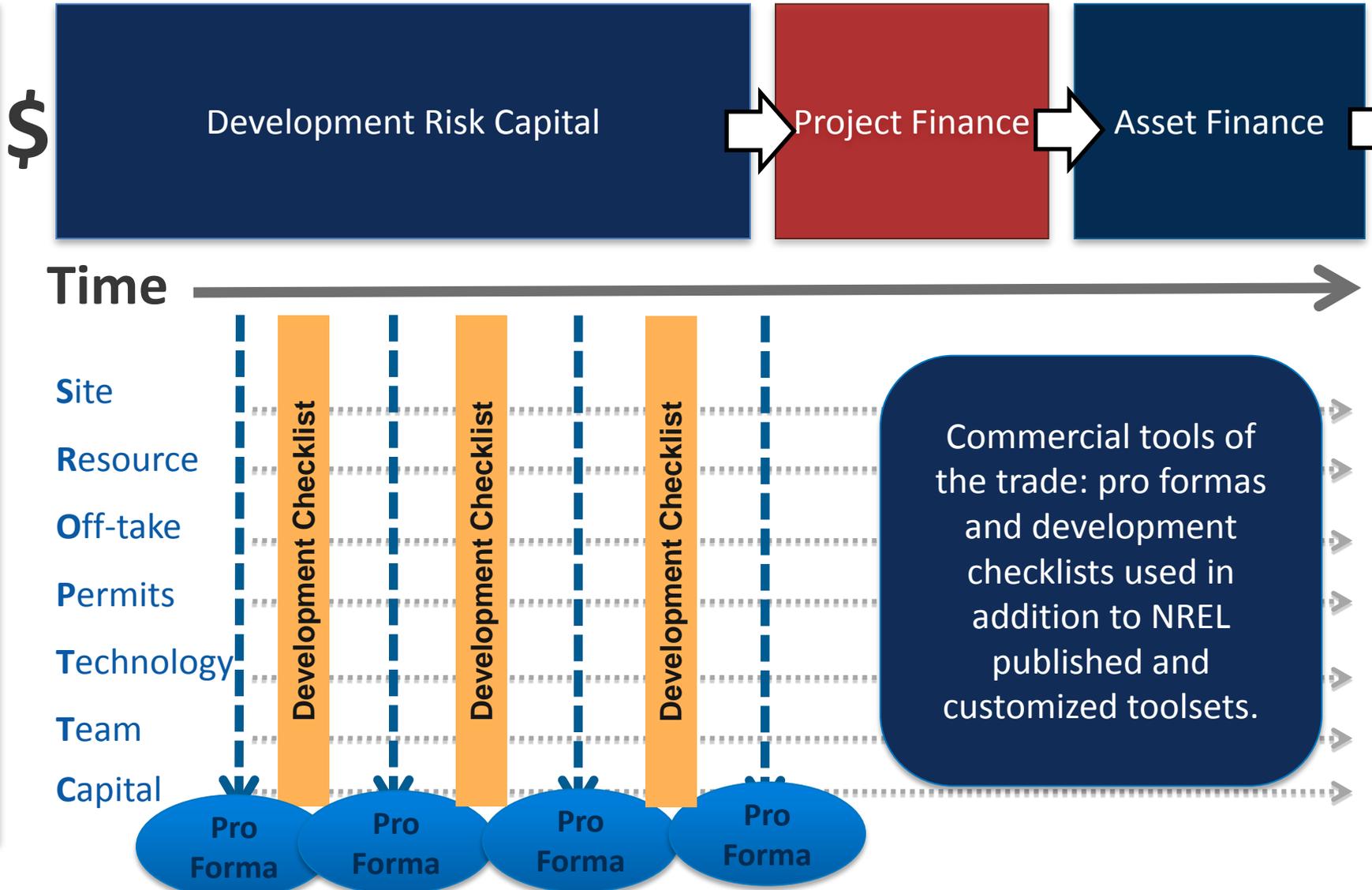
# Development Process

Project Motivation – Using BEPTC Framework



# Applying Tools

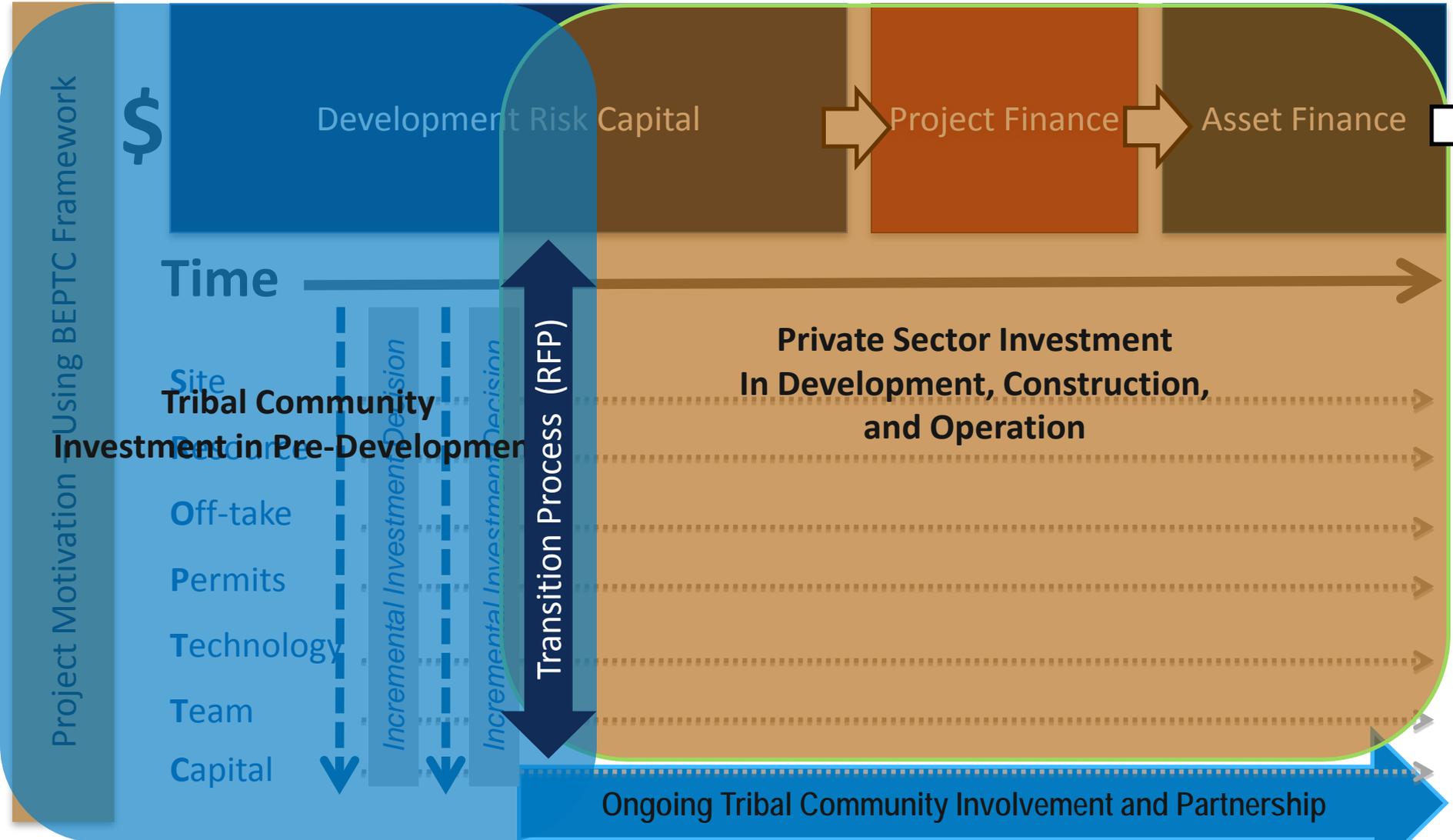
Project Motivation – Using BEPTC Framework



# SROPTTC – Information Framework

Site	Resource	Off-Take	Permits	Technology	Team	Capital
No site, no project	Engineering assessment	Off-take contract – (Revenue)	Anything that can stop a project if not in place	Engineered system	Professional, experienced, diverse	Once all is in place you can structure financing
<ul style="list-style-type: none"> <li>• site control</li> <li>• size and shape</li> <li>• location to load</li> <li>• location to T&amp;D</li> <li>• long-term control</li> <li>• financial control</li> <li>• clear title</li> <li>• lease terms/length</li> <li>• assignment or collateral concerns</li> <li>• environmental</li> <li>• slope</li> <li>• soils/geotech</li> <li>• vehicle or labor access</li> <li>• O&amp;M access</li> <li>• upgradable</li> <li>• other infrastructure</li> <li>• survey</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• volume</li> <li>• frequency</li> <li>• variability</li> <li>• characteristics (power vs. speed)</li> <li>• 24 hour profile</li> <li>• monthly variability</li> <li>• seasonality</li> <li>• annual variability</li> <li>• weather dependence</li> <li>• history of data</li> <li>• siting decisions</li> <li>• std. deviation across key parameters</li> <li>• P50, P90, P95</li> <li>• Technology suitability</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• credit of counterparty</li> <li>• length of contract</li> <li>• terms and conditions</li> <li>• reps and warranties</li> <li>• assignment</li> <li>• curtailment</li> <li>• infrastructure/interconnection</li> <li>• performance</li> <li>• milestones</li> <li>• enforcement</li> <li>• take or pay</li> <li>• take and pay</li> <li>• pricing</li> <li>• pricing terms (fixed or variable)</li> <li>• electrons and/or attributes</li> <li>• liability</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• local permitting/entitlements</li> <li>• building permits</li> <li>• land disturbance</li> <li>• environmental</li> <li>• cultural impacts</li> <li>• resource assessments</li> <li>• wildlife impacts</li> <li>• habitat</li> <li>• NEPA, EIS</li> <li>• utility interconnection</li> <li>• other utility or PUC approvals</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• engineering design plans</li> <li>• construction plans</li> <li>• not generic "solar panel and inverter</li> <li>• engineered resource/conversion technology/balance of system designs</li> <li>• Design Development or Construction drawings</li> <li>• Specifications</li> <li>• Bid set</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• business management</li> <li>• technical expertise</li> <li>• legal expertise</li> <li>• financial expertise</li> <li>• utility interconnection expertise</li> <li>• construction/ contract management</li> <li>• operations</li> <li>• power marketing/sales</li> <li>• etc.</li> </ul>	<ul style="list-style-type: none"> <li>• development equity</li> <li>• project equity</li> <li>• project debt</li> <li>• mezzanine or bridge facility</li> <li>• tax equity</li> <li>• grants, rebates, other incentives</li> <li>• environmental attribute sales contracts (RECs)</li> <li>• bond finance</li> <li>• non-recourse project finance</li> <li>• etc.</li> </ul>

# Transfer of Development Risk



# Summary

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- Acknowledge the overall situation and environment
- In the early stages you are in the role of “project developer”, use the discipline developed by the private sector
- Establish the motivation, build consensus on the fundamentals
- Make incremental investments to develop the opportunity using an iterative process focused on managing risk

# Thank You.

