

# An introduction to the key variables in renewable power project risk

**A Webinar Presented for:**



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THE RENEWABLE ENERGY MINI MBA

09 JULY - 13 JULY  
MEXICO

17 - 21 SEPTEMBER  
LONDON

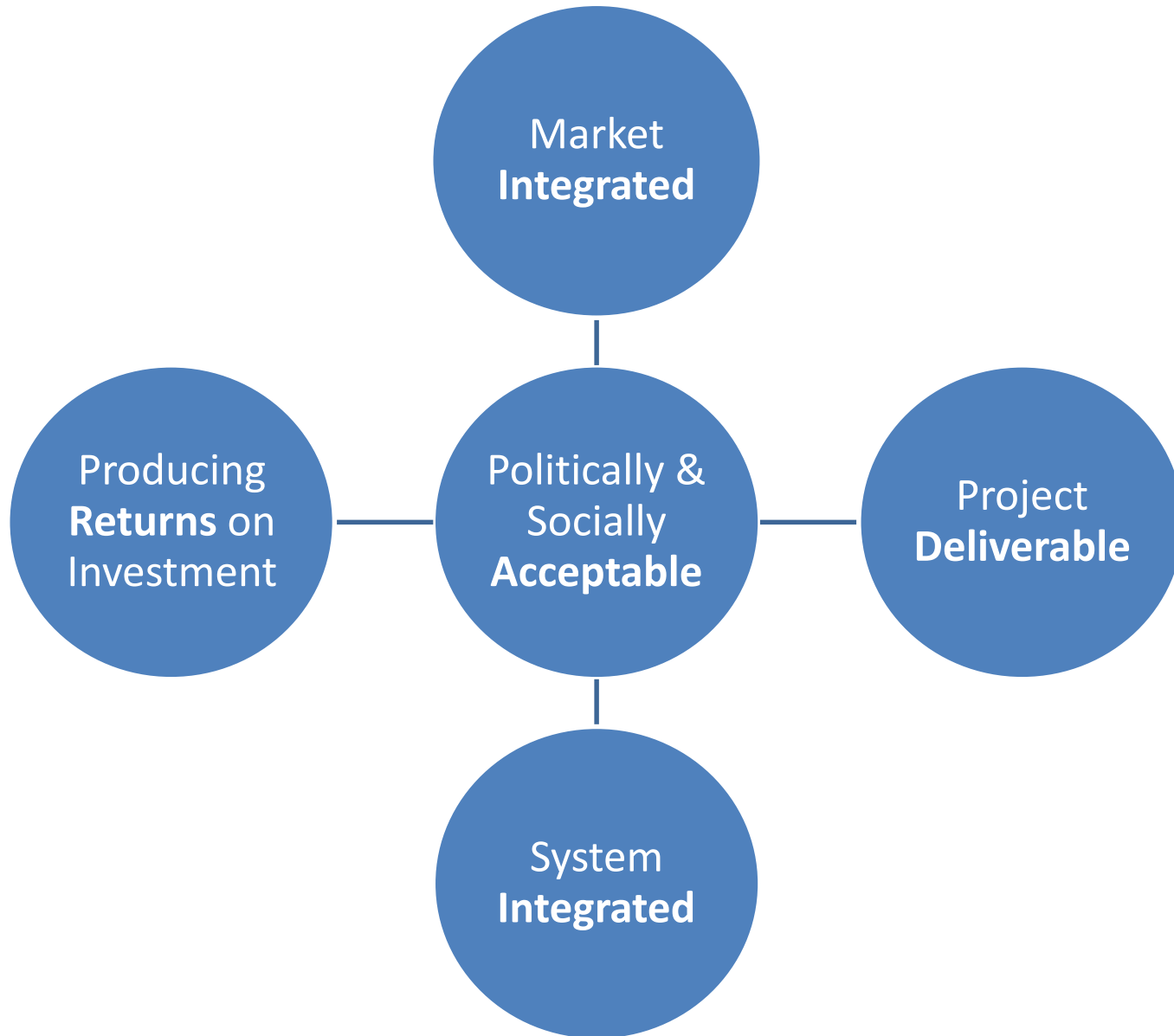
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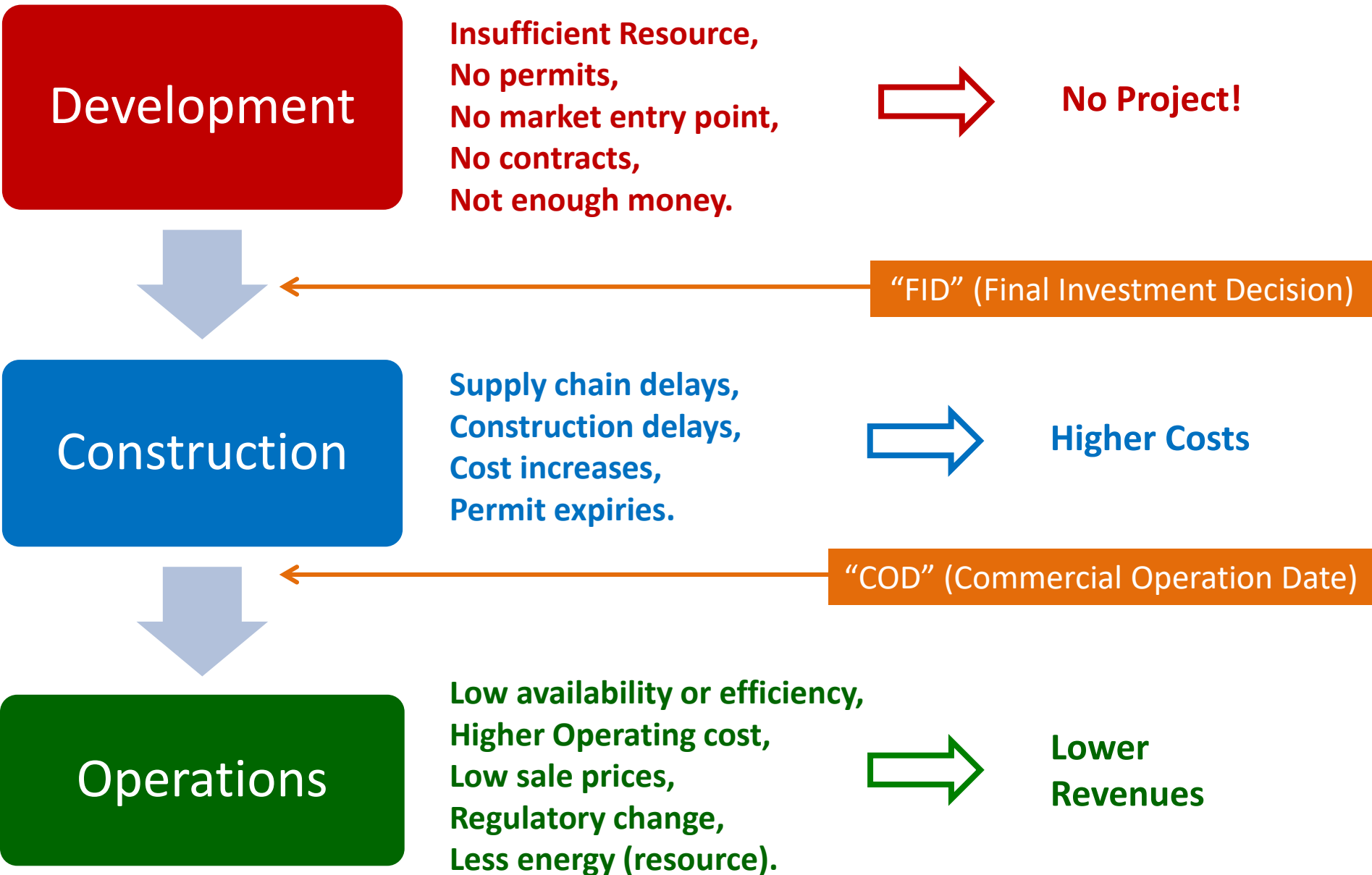
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# Renewable power must be...



# The project lifecycle & risks



# Where do risks come from?

## “Internal”

## “External”

Factors you can control*	Factors you can't*
Market choice	Energy policy changes
Customer choice (for off-market sale)	Tax & “business environment” changes
Electricity generation	Market demand (& supply)
PPA price and terms	Market prices (for electricity, RECs etc.)
Project equipment & build costs	Workforce & wages
Development & permitting costs	Planning rules
Financing costs	Public opinion
Project operating costs	Supply chains
Project reliability	Financial markets
Project performance	The weather

*\*Discussion point... to what extent are these statements always true?!?*

# Money: a viable business plan

## Revenues

>

## Costs

Now

**Energy (MWh) x Price (\$/MWh)**

**Installed Cost (Capex)**

- “Stuff” (Equipment)
- Labour & “soft” costs

### + Other Revenues?

- Carbon Credits
- Capacity Payments
- Grid Services

### + Ongoing Costs

- Operations
- Maintenance
- Fuel
- Debt repayments
- Dividends
- Tax payments
- Carbon Costs

**Future** (→ Project Duration)

# Money: a viable business plan

## Revenues

> Costs

**Energy (MWh) x Price (\$/MWh)**

*Capacity Factor  
(Resource)*

**+ Other Revenues?**

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**+ Ongoing Costs**

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Now

*Capex  
& Opex*

Future (→ Project Duration)

# Energy & money: capacity factor

Project design & reliability

Nature

Plant Availability

Resource Availability

Not operating the whole time

Operating below capacity

Actual **ENERGY** Generated (MWh)

**Capacity Factor**

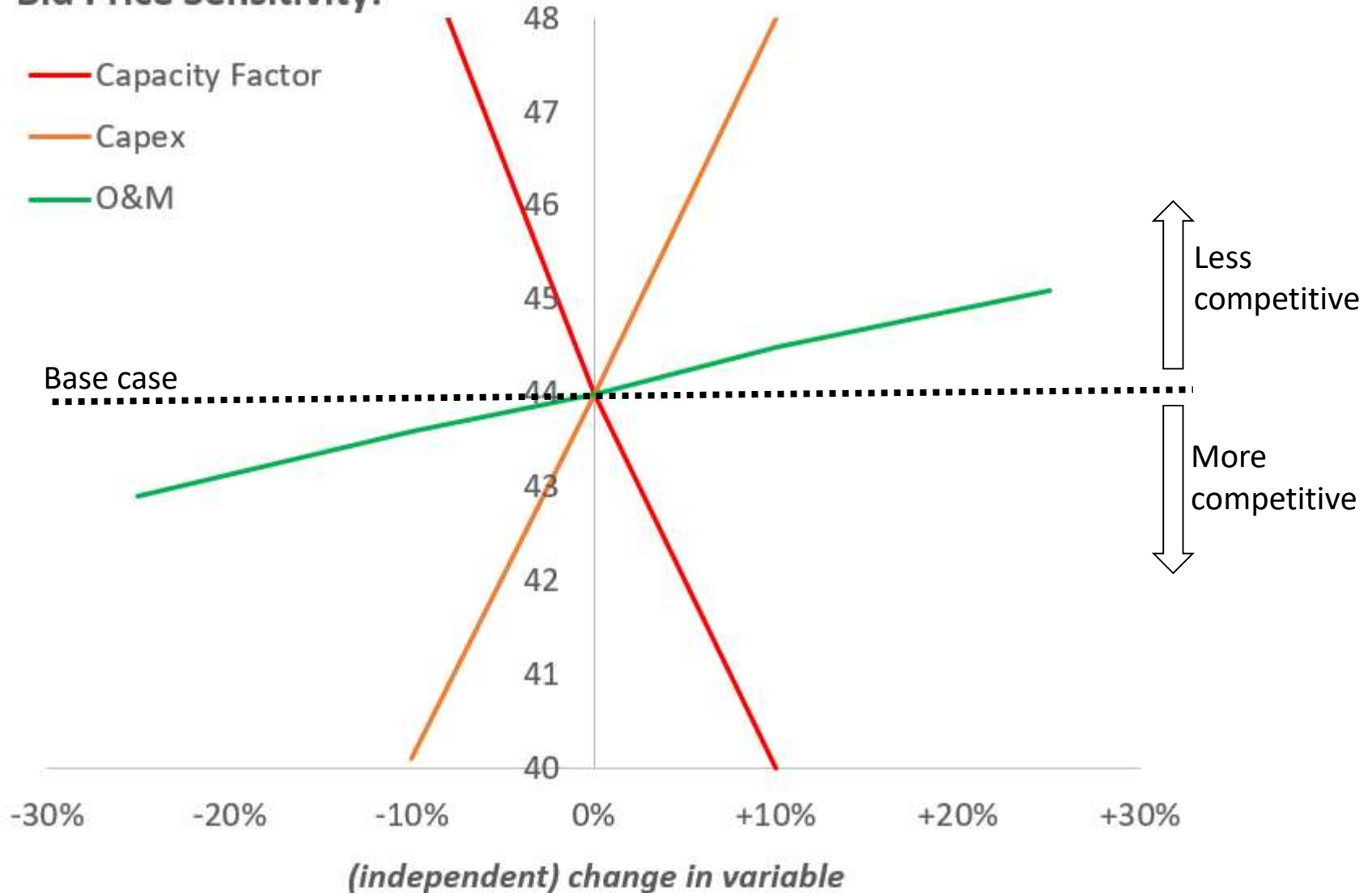
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**CAPACITY (MW) x TIME Period (h)**

Theoretical maximum energy generation

# Sensitivity: Energy & Capex vs. O&M

## Bid Price Sensitivity:





# Money: a viable business plan

## Revenues

> Costs

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(Resource)*

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Installed Cost (Capex)

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+ Ongoing Costs & Opex

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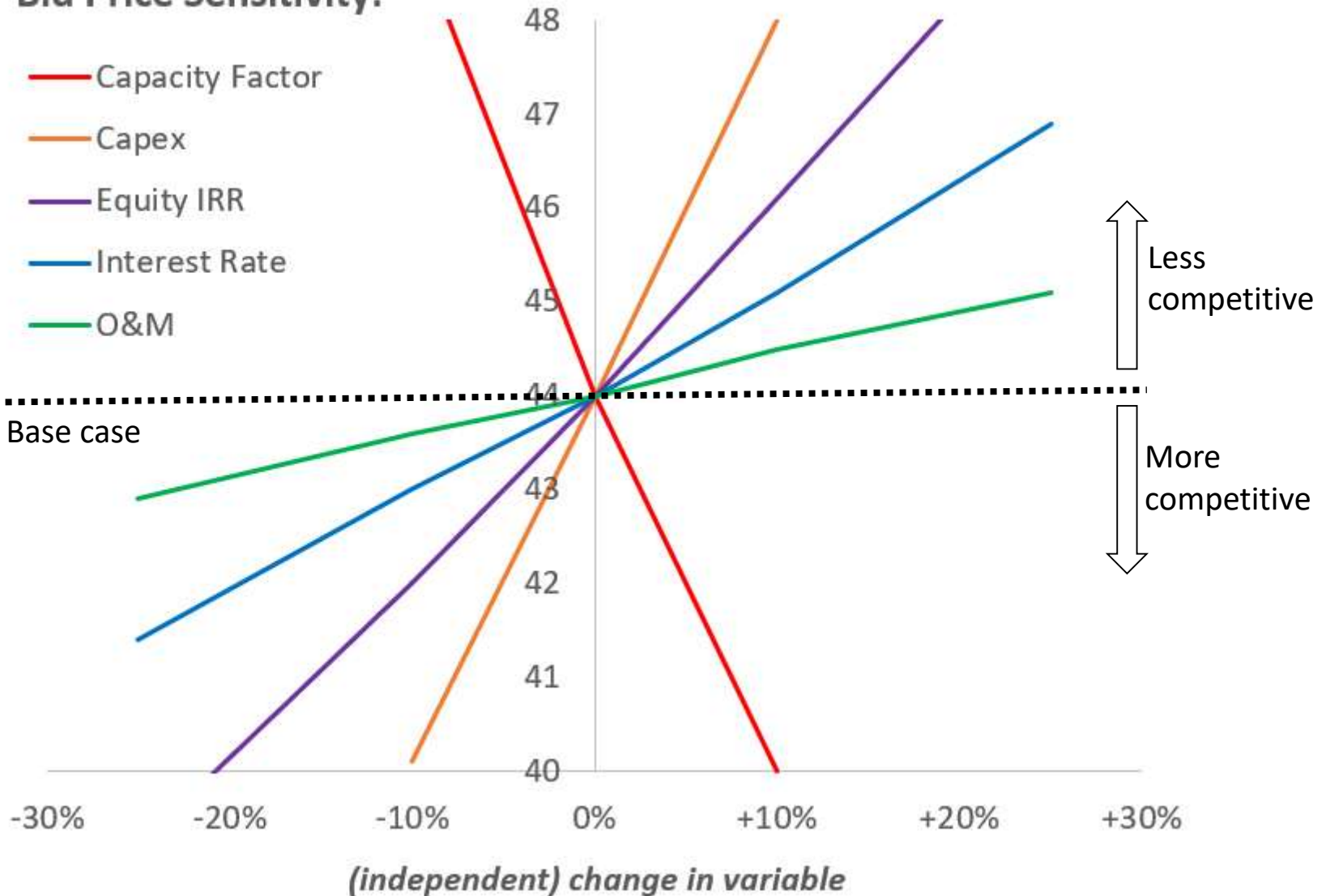
*Cost of Money*

Now

Future (→ Project Duration)

# Sensitivity to Financing Costs?

## Bid Price Sensitivity:



# Risk & the cost of money

Debt	Equity
Fixed returns	Upside (and downside) opportunity
Low risk appetite	Risk appetites vary
Administrative burden	Investment objectives vary
“Debt-like” innovations?	Expanding universe?

↑  
“Leverage”

***Structure: revenue certainty & debt sizing***

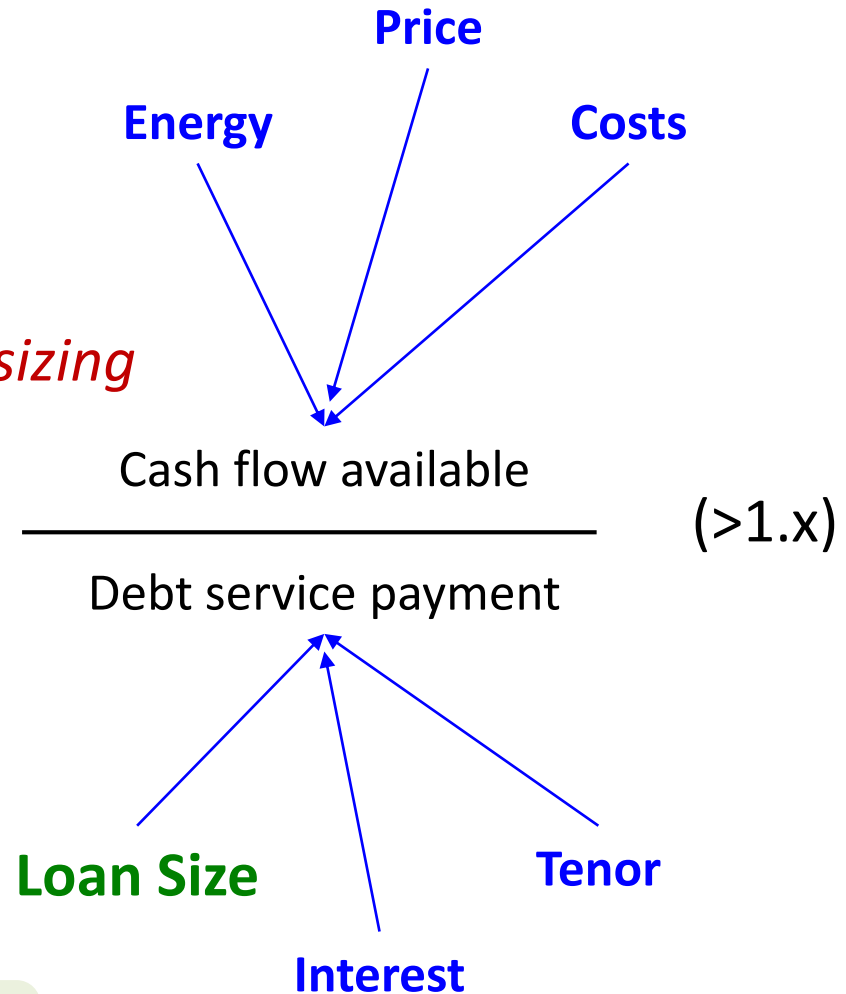
e.g. DSCR (debt service coverage ratio) = 
$$\frac{\text{Cash flow available}}{\text{Debt service payment}} \quad (>1.x)$$

# Resource assessment & debt sizing

*More uncertainty in energy production means more uncertainty in energy (**cash**) generation!*

**Structure: revenue certainty & debt sizing**

e.g. DSCR (debt service coverage ratio) =



Underestimating energy may mean a smaller loan, which means more equity (and hence less return on that equity)

Lesson: insufficient **resource assessment work** brings financial and competitive risk into the project!

# Summary

*“Key variables in renewable power project risk”:*

**It's important to analyse...**

- Internal & external sources of risk,
- Project phases, timescales & changing risks,
- Financial sensitivity to key variables,
- The interconnectivity between key variables.

# Thanks for Listening!

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