

# IFC – ESMAP- RENEWABLE ENERGY TRAINING PROGRAM

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## Wind Module

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### II. Wind Project Development, Implementation, and Financing

Washington DC, June 16th 2014



## Wind Project Development, Implementation, and Financing



- **Financial Modeling**
- Key Inputs & Considerations
- Cost of Generation
- Appendix

## Valuation Key Principles

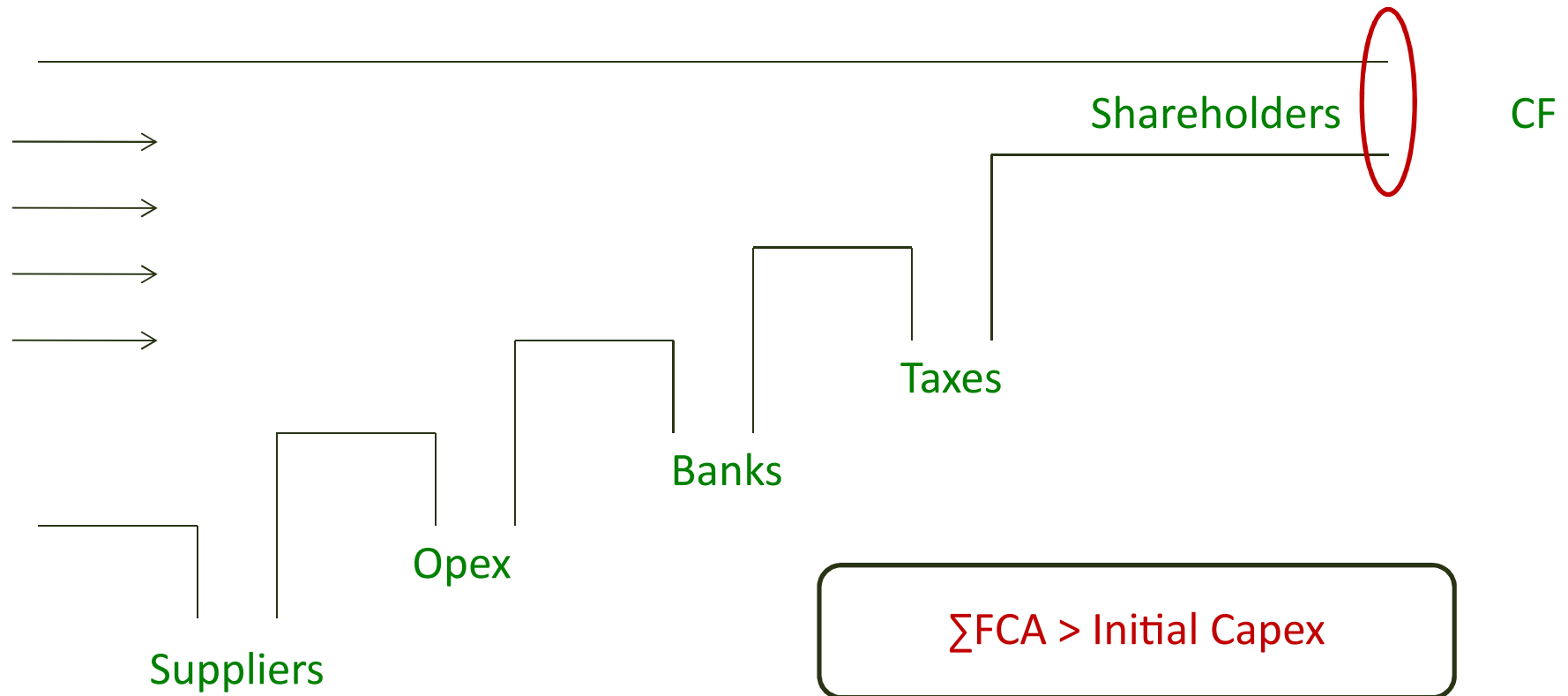
- A project generates economic value when it generates **cash to remunerate costs for all capital employed**
- The same project can have a **different value** for different investors
- Economic valuation reflects **future expectations** for the project
- Economic valuation needs to reflect **risks and uncertainties**



- Methodology that includes all main inputs and risks consideration is **Discounted Cash Flows**

## Valuation Key Principles

- A project generates economic value when it generates **cash to remunerate costs for all capital employed**



## Valuation Key Principles

- The same project can have a **different value** for different investors

Different  
Expectations

Different Risk  
Perception

**Profitability means nothing if it's not associated to Risk**

## Valuation Key Principles

- Economic valuation reflects **future expectations** for the project

Free  
Cash Flow

Debt  
Cash Flow

Shareholders  
Cash Flow

## Valuation Key Principles

- Economic valuation needs to reflect **risks and uncertainties**

**i WACC!**

**Which are the main risks to be included? How do we take them into consideration?**

## Cash Flow Calculation

+	Operating Incomes: (Production x €/MWh)
-	Operating Costs: (O&M, land,...)
=	EBITDA
-	Taxes (over EBIT)
-	Capex
+	Working Capital
+	Terminal Value
=	Free Cash Flow

### Free Cash Flow

- No financing Costs included



## Cash Flow Calculation

=	Free Cash Flow
+	Debt
-	Debt Amortization
-	Interests
=	Shareholders Cash Flow

### Shareholders Cash Flow

- Real IRR for the invested Capital

## Key Metrics

- Years to achieve WACC
- Price to achieve WACC
- % Incomes subject to merchant exposure
  - % Incomes subject to regulatory risk
- Terminal Value contribution to Value Creation
  - Sensitivity to Key inputs

## Basic components and structure of model

**See Excel Example**

**Case Study: Brazil Case (BNDES Financing)**

**Case Study: Tax Equity Investor in US**

## Risks...

- What about Risks? Let's review Key inputs first!

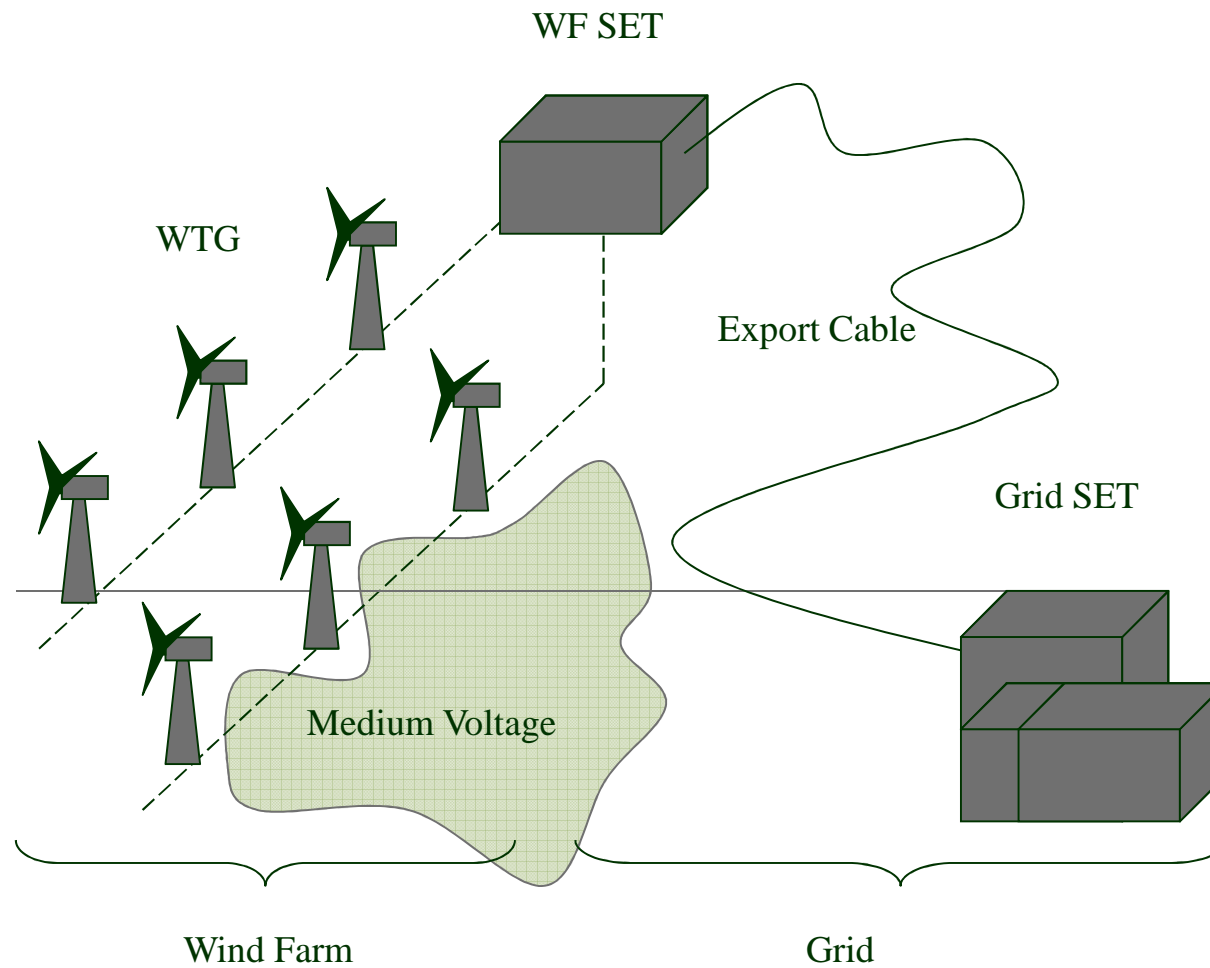
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- **Key Inputs & Considerations**
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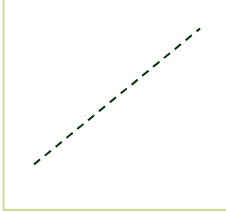
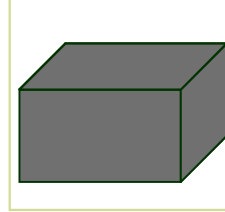
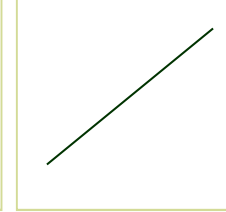
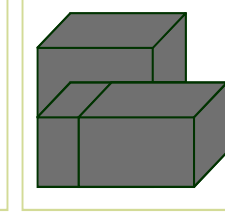
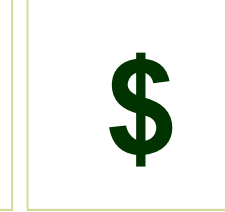

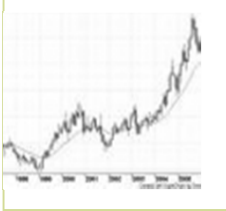










# Key Inputs & Considerations

## Key Inputs



# Key Inputs & Considerations

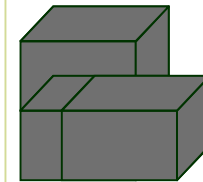
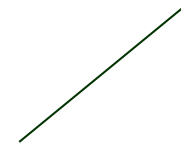
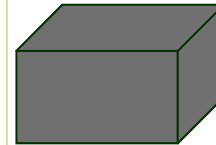
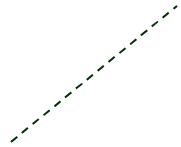
## Key Inputs

Capex						
Incomes						
Opex						
Financing						

# Key Inputs & Considerations

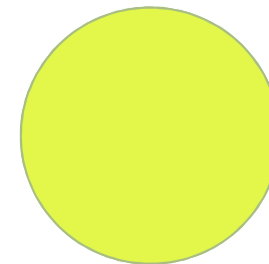
## Key Inputs

Capex



- WTG prices rationalization
- Full Risk Approaches
- BOP smaller as a percentage
- One supplier approach is over
- Complex tender processes
- Partial financing of the construction

Still Bankable





# Key Inputs & Considerations

## Key Inputs

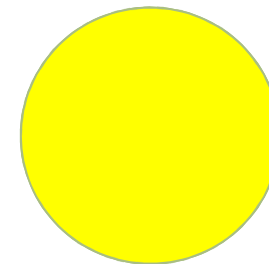
**Incomes**



**Capacity Factor**

- External Expert report
- Discussions on Probability P70?
- New measurements technologies
- More historical data

**Bankable?**



# Key Inputs & Considerations

## Key Inputs

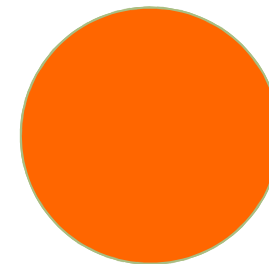
Incomes



Price Curve

- PPA required?
- **Regulatory vs. Merchant Risk!**
- Shorter support mechanism
- Potentially based in tax incentives
- Payback... due to taxes or incomes???
- What is more fixed? New Approach??
- USA CASE: Tax Equity Investor

Bankable?



# Key Inputs & Considerations

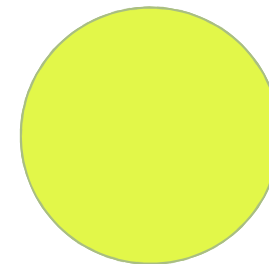
## Key Inputs

Opex



- Full Risk Approach...
- ... Riskier but cheaper!!!
- Local Taxes!!
- Regulatory Requirements!!!
- As long as support mechanism goes off, variable cost analysis needed.

Still Bankable



## Key Inputs

### Financing



- Cost of equity needs to be reduced in order to take cost of generation down!!

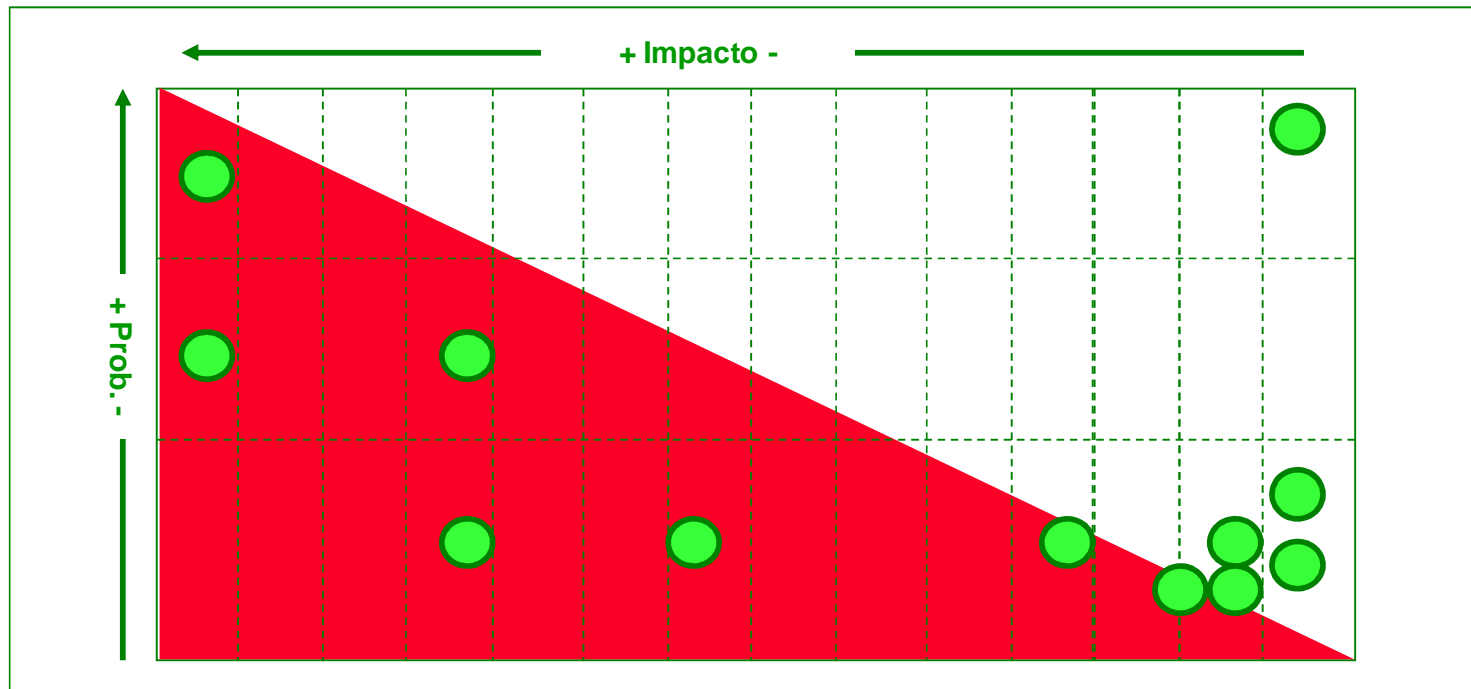
### Reducing Risks

- Cost of debt needs to be reduced in order to take cost of generation down!!

### Sharing Knowledge / Working together

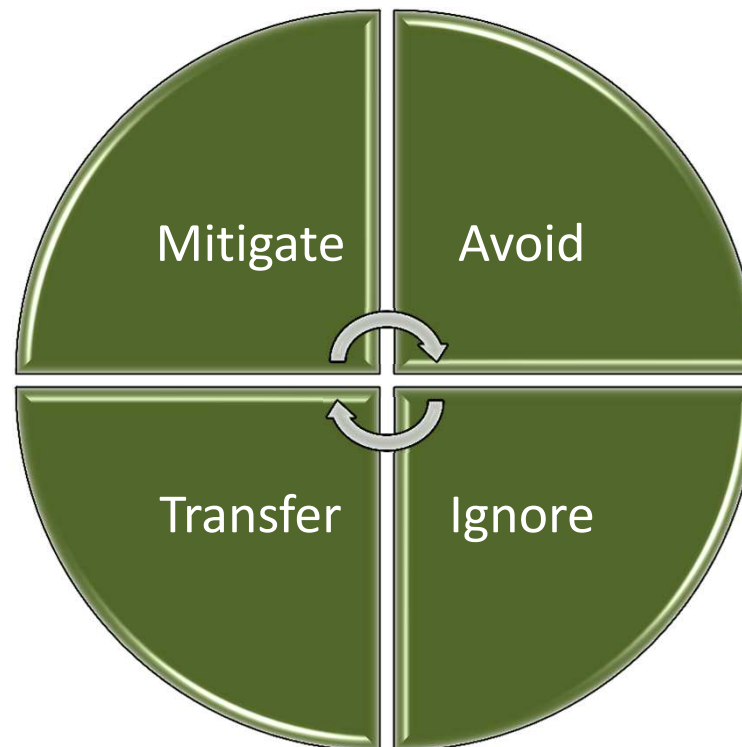
## Sensitivities

- What are the main risks?
- Those that have a higher impact and probability of happening



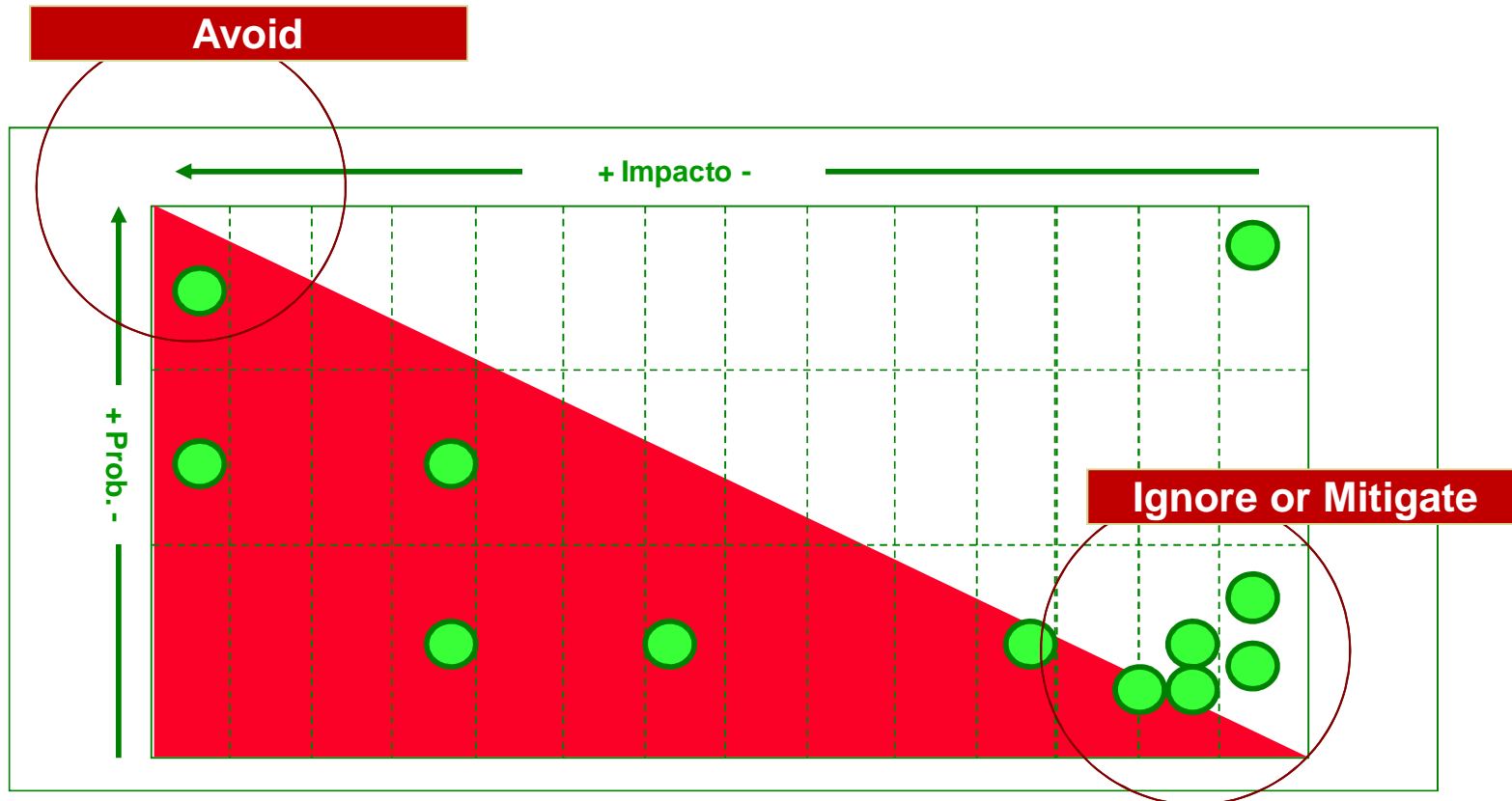
## Sensitivities

- What do we do with our risks?



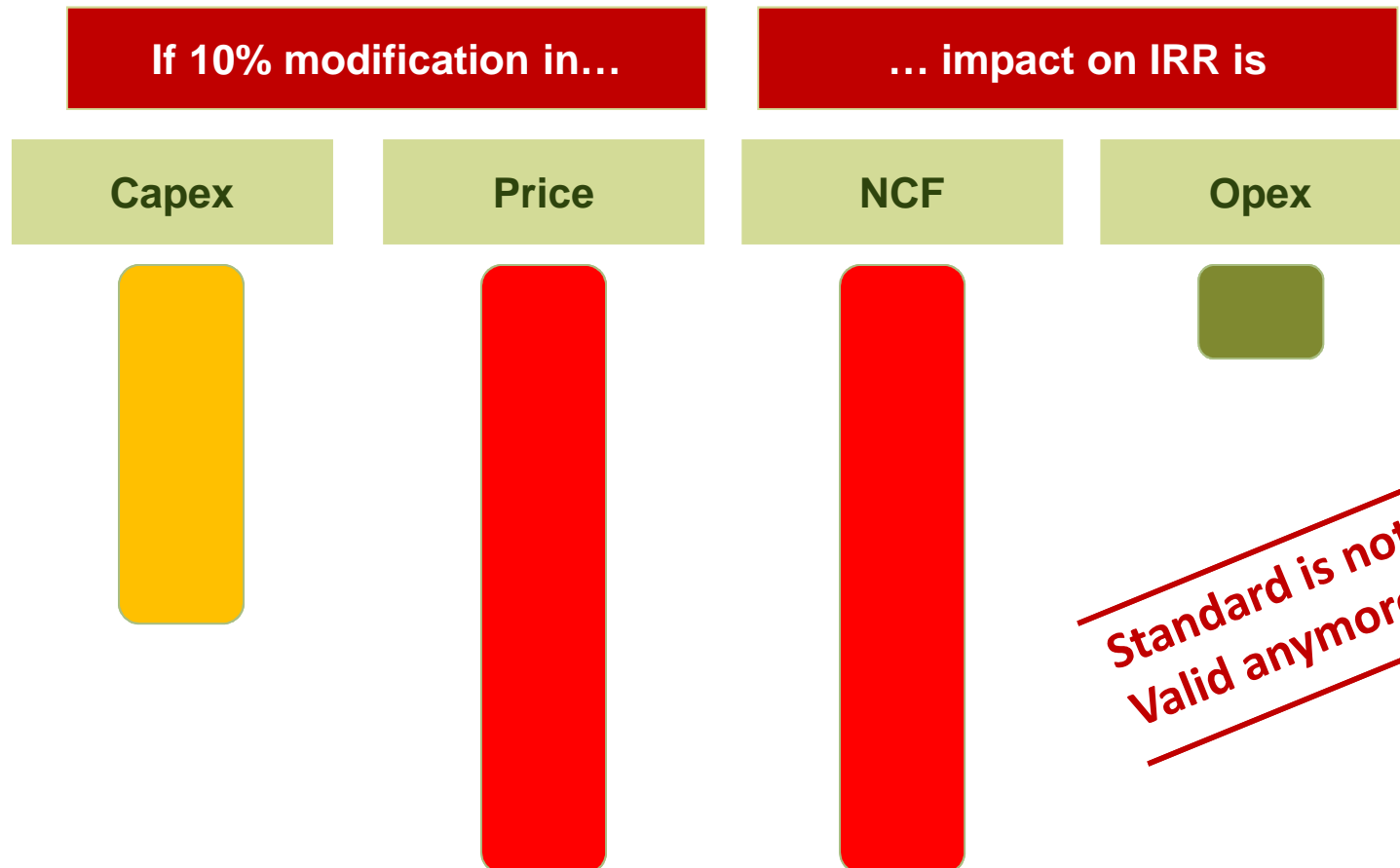
# Key Inputs & Considerations

## Sensitivities



# Key Inputs & Considerations

## Sensitivities



**Standard is not Valid anymore!!**

There is a need of studying particular cases... High or Low prices curves...



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# Cost of Generation and Externalities

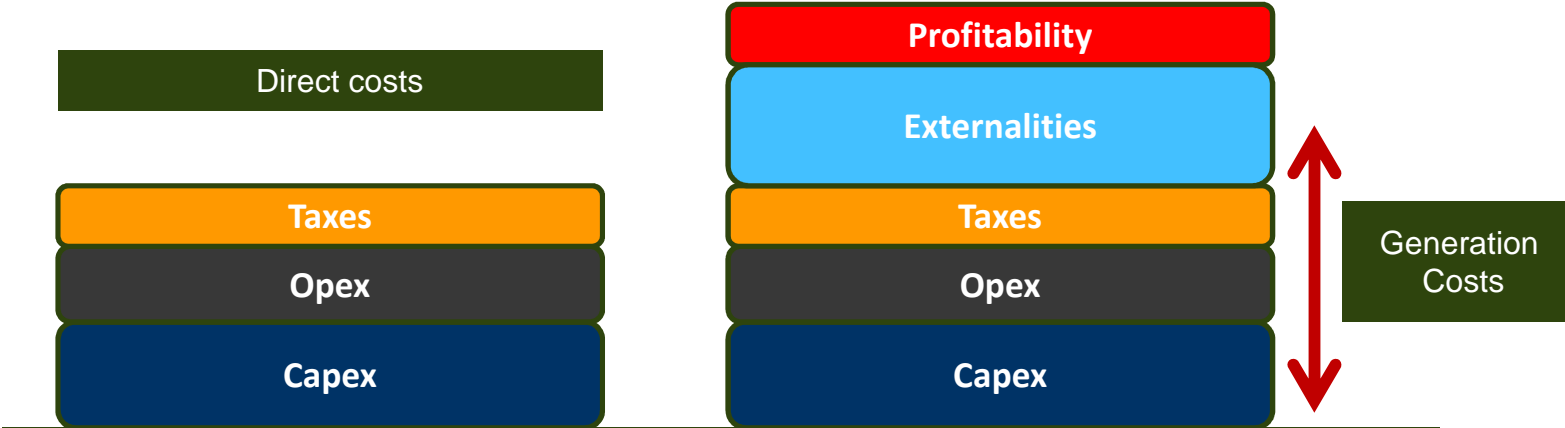
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**What is generation cost?**

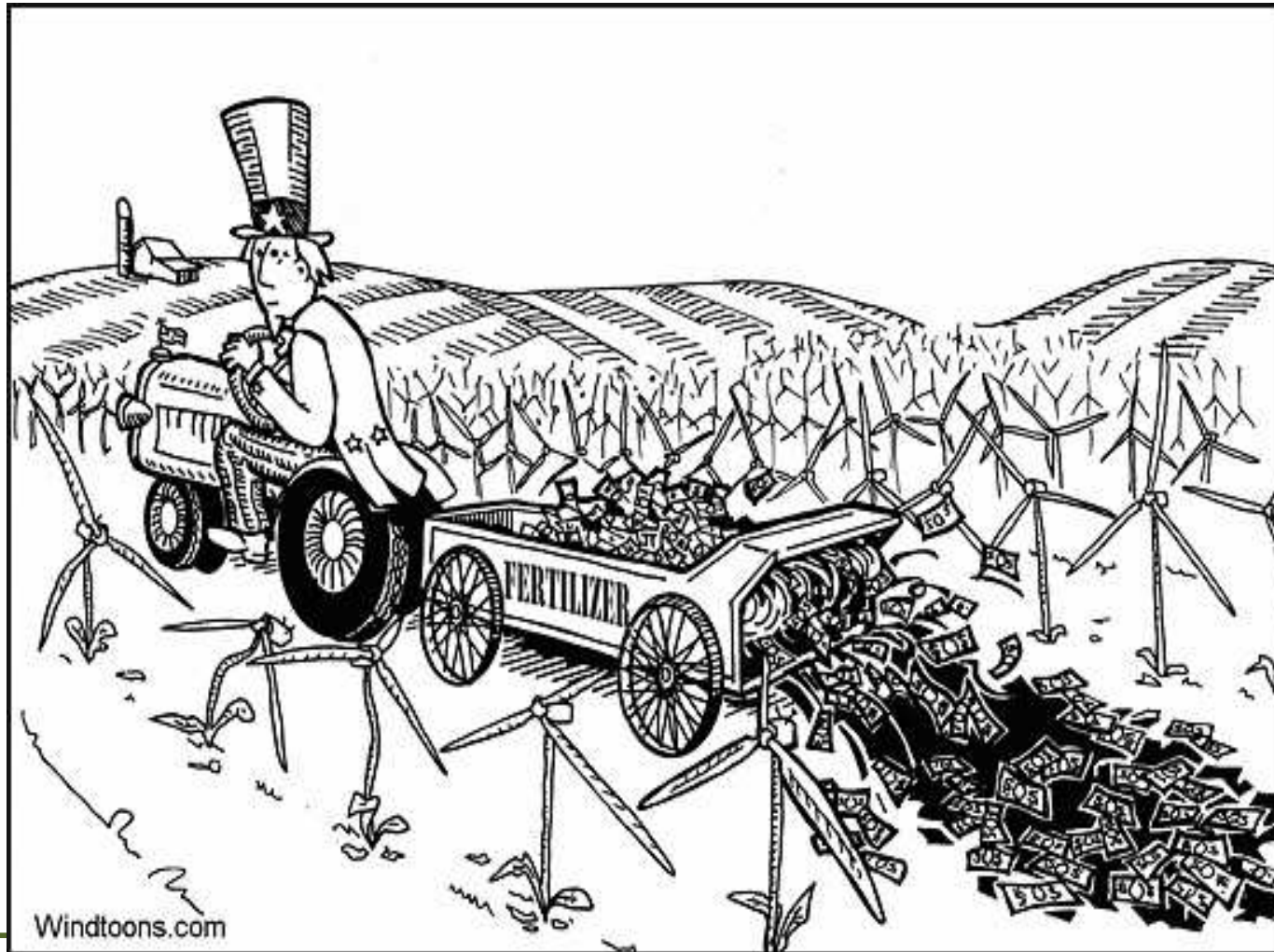
**How is it calculated?**

**What's included in the calculation?**

# Cost of Generation and Externalities

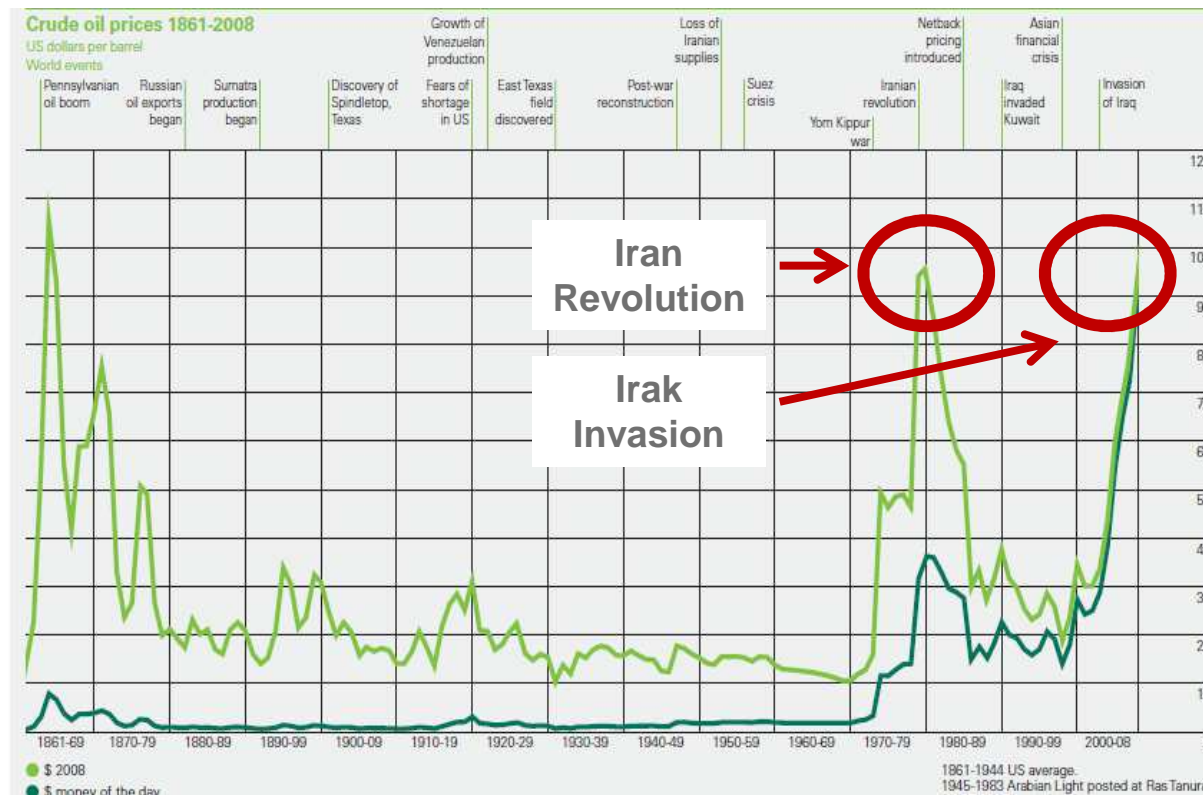


Are Renewable energies more expensive than others?



# Cost of Generation and Externalities

## How to calculate... volatility of commodities



How to calculate... energetic independence?



How to calculate... manageability?





How to calculate... additional risks?





How to calculate... climate change?

