HUNGARIAN PRODUCTION SIMPLIFICATION

IMPORTANCE AND POWER OF INFROMATION HAVE

SURFACE FACILITIES DEPARTMENT E&P

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MOLGROUP

AGENDA

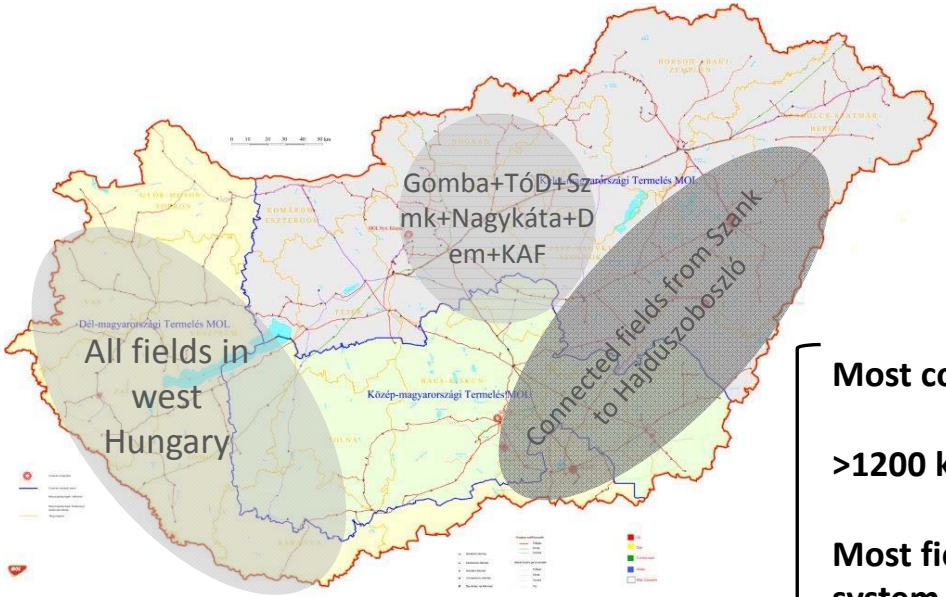
- Find the right approach
  - Big picture first then → detailed analisys
  - Data availibility
  - Time → present – future
- Key objetvie(s) → unit cost
- How can we achieve the goal(s)

APPROACH → PICTURE

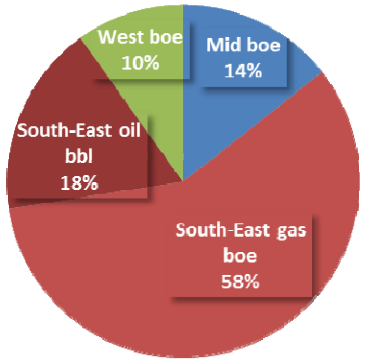
Think | Assess | Select | Define | Implement

3 Independent Production Regions was identified:

- West HUN
- Mid HUN
- South-East HUN



Hungarian production by regions



Most complex and difficult system

>1200 km long pipline network

Most fields, plants and facilities (crude and gas) are in the system

Provide the biggest part of the HUN production ~35k boepd
- **gas production 58%**
- **crude production 18%**

New 2H gas standard regulation critical for this region

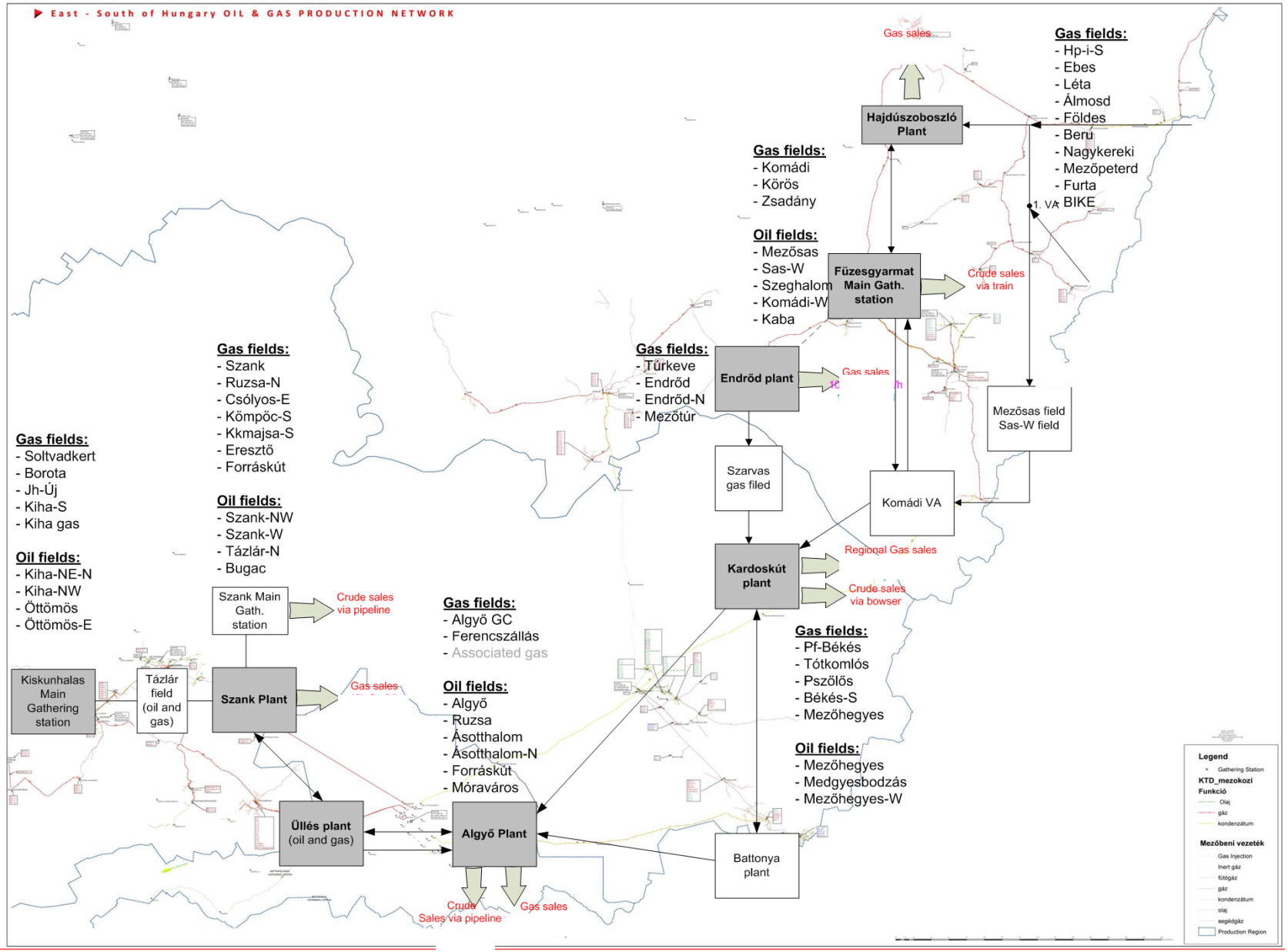
Area age average 50 yrs.

Identified 8 key (mainly gas) facilities as assemblies in the system:

- **Kiskunhalas main gath. station**
- **Szank gas plant**
- **Üllés plant**
- **Algyő plant**
- **Kardoskút plant**
- **Endrőd plant**
- **Füzesgyarmat mein gath. station**
- **Hajdúszoboszló plant**

APPROACH → PICTURE

Think | Assess | Select | Define | Implement



APPROACH → PICTURE

Think | Assess | Select | Define | Implement

MOL FS E&P opex

MOL FS E&P South-East Prod. System opex

Infield cost (well site, gathering system) **Facility/Plant cost** (HC processing & conditioning)

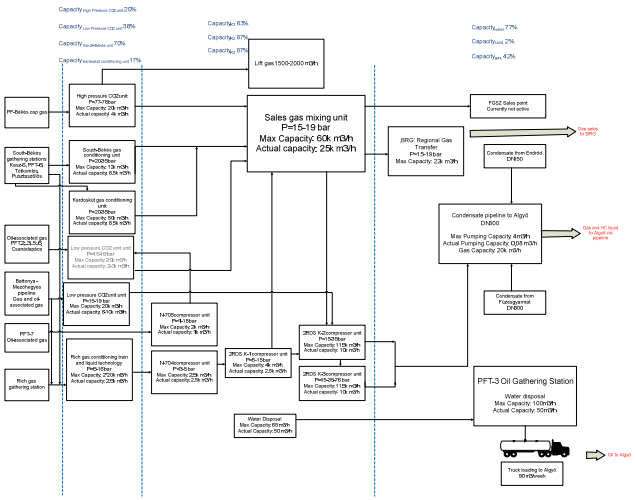
Production related cost
(Fix – Variable – Royalty – Depriciation)

Non-Production related /allocated/ cost
(G&A, HQ, FS internal, etc.)

Fix cost > **Maintenance, Labour, Other**
Variable cost > **Electric Power, Fuel gas, Chemicals, Transportation**

current status

Generate specific cost at every places for:



Crude handling/Emulsion breaking
Crude processing (stabilization)
Water handling and re-injection
HC transportation/delivery/storage
Pressure boosting (gas-liquid) by stages
Gas conditioning (dehydration, HC dew-point)
Gas processing (NGL recovery)
Gas sweetening (H2S, CO2 removal)

Take consideration Minor CAPEXs as operation related cost

APPROACH → DATA AVAILABILITY

Think | **Assess** | Select | Define | Implement

***All Required Data Will Be Shared* but…**

- What Is The Current Status Of Data Availability?
- How To Deal With Areas Of No Data?
- How To Refine The Quality Of Currently Existing Data?
- How to make managerial decisions upon areas of poor data?
- What is the cost of obtaining sufficient data, of good quality?

Legend	
	Not Available
	Low Quality Data available
	Medium Quality Data available
	Data available

APPROACH → DATA REQUIREMENTS

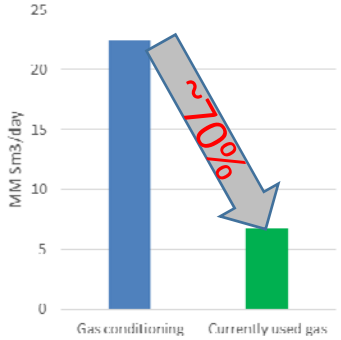
Think | **Assess** | Select | Define | Implement

6	Production related CAPEX-OPEX		
a.	*CAPEX (main overhauls, preventive maintenance)*		
b.	*OPEX (Variable and Fix costs)*	*Available but, Breakdown of OPEX Costs need clarity*	*Available but, Breakdown of OPEX Costs need clarity*
7	Production flow-rates by wells		
8	Availibility, condition and performance of major equiment		
9	Capacity assessments (Pipelines, facilities)		
10	Sales requirments and prizes (crude, gas, different NGL products)		
11	Unplanned shut-downs		
12	Environmental releases		
a.	Emission environmental reports		
b.	Spill frequency and size		
13	3rd party commitments		
14	Emission limits (GHG, etc.)		
15	NGL Price Forecast		*We can use primises*
16	Hungary Taxation System		
17	ABEX		
18	MOL Management Fee		
19	Equipment No		
20	Equipment of State Requirement	*Need to clarify*	*Need to clarify*

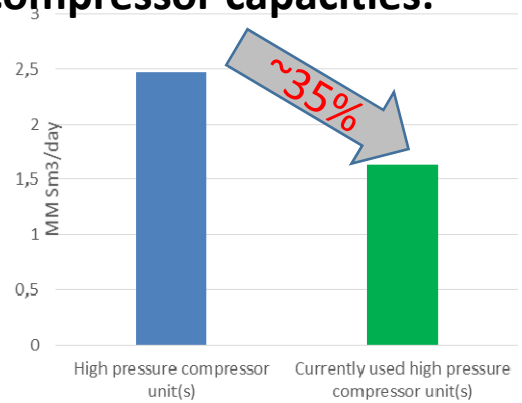
APPROACH → CAPACITIES - PRESENT

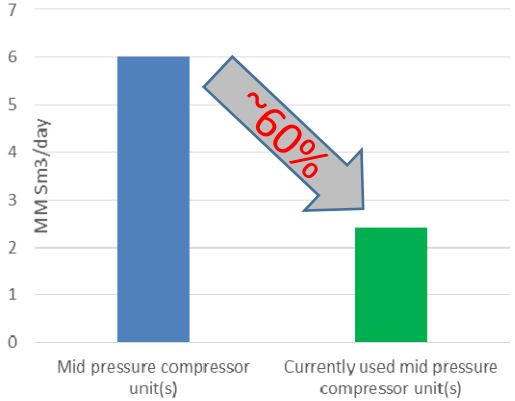
Think | Assess | Select | Define | Implement

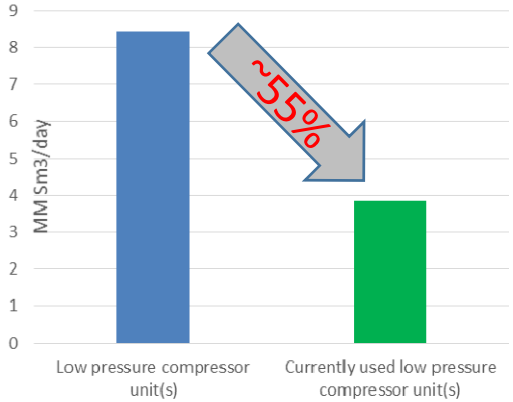
Gas conditioning plant capacity:



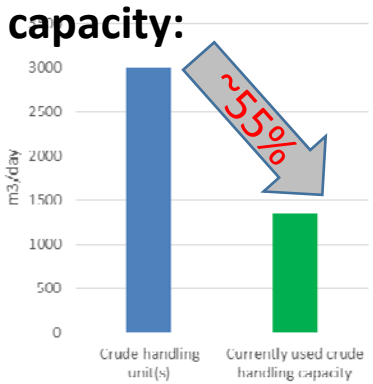
Compressor capacities:



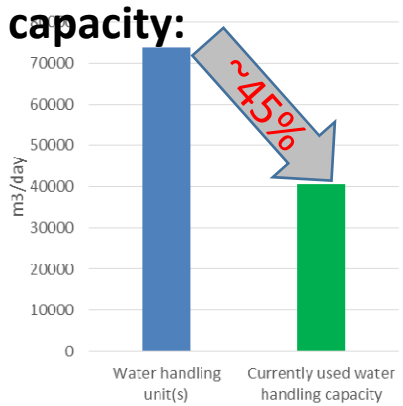




Crude handling capacity:



Water handling capacity:



OBJECTIVES

MOLGROUP

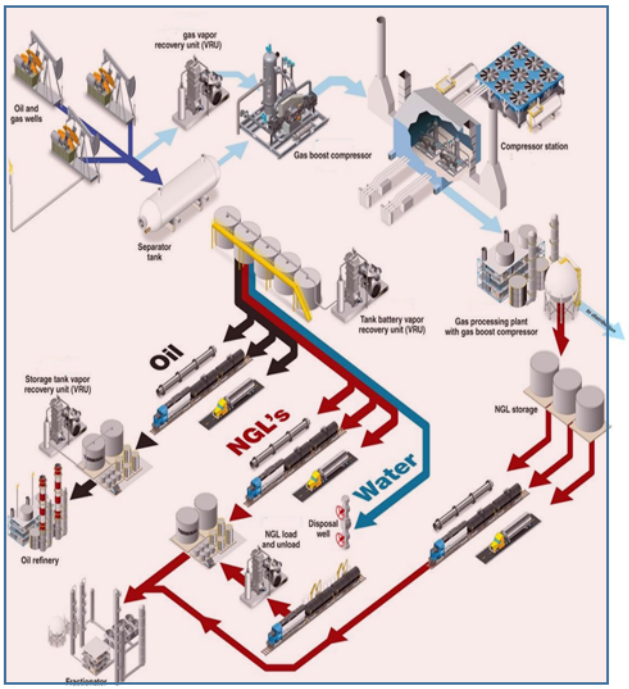
KEY STUDY OBJECTIVE

Think | Assess | Select | Define | Implement

Develop short and long term "strategies" to optimise utilisation of existing *(surface)* Production Systems to achieve unit production cost below the **given threshold** and enhance value considering:

1. Future Production Potential:
   - Exploration opportunities,
   - (Un)/planned developments,
   - Ongoing optimisation initiatives/activities, and
   - 3rd party contracts / committments

2. Future Regulatory Requirements:
   - New EU gas quality standard (H_2S, CO_2, DewPoint)
   - Emission limits (GHG)



STUDY OBJECTIVE

Think | Assess | Select | Define | Implement

- **Maximize system capacities**

  Expedite field developments

- **Unused Ullage + high opex**

  Time - Expedite decommissioning

- **Identify bottlenecks (2H gas standard, sour gas contents, water handling, etc.)**

  Debottleneck with new equipment or salvage from elswhere

- **Determine strategy/concept (road map) for production system development**
- **Keep flat or reduce unit cost through variable (energy) and fix (maintenance) cost**

STUDY GOALS → VALUE PREPOSITION

Think | **Assess** | Select | Define | Implement

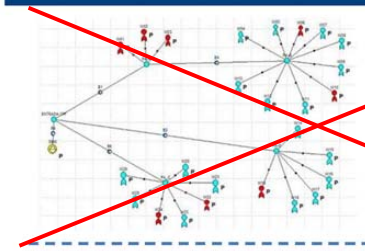
Short/Long	Value
Short/Medium Term Goals	Having a tool **MODEL** for checking the existing operations in SE Hungary (Accurate information database)
	Options for Process Simplification.
	Possible maintenance of Unit Cost (Capacities, maintenance optimization & 3rd Party Services)
	Eliminating the Bottlenecks & increase the reliability of the system
Long Term Goals	Support the strategic decisions (CAPEX, Decommissioning, ABEX, well focused on decision making)
	Similar model launch at OpCos, lessons learned WS.

HOW TO ACHIEVE THE GOALS

ACHVIEVE GOALS → FIND THE TOOL

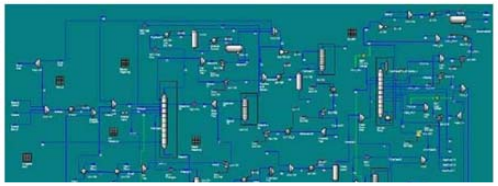
Think | **Assess** | Select | Define | Implement

Potential Software Options (Steady State only)



Option 1: Hydraulic model (Pipelines only)

PIPESIM (example)

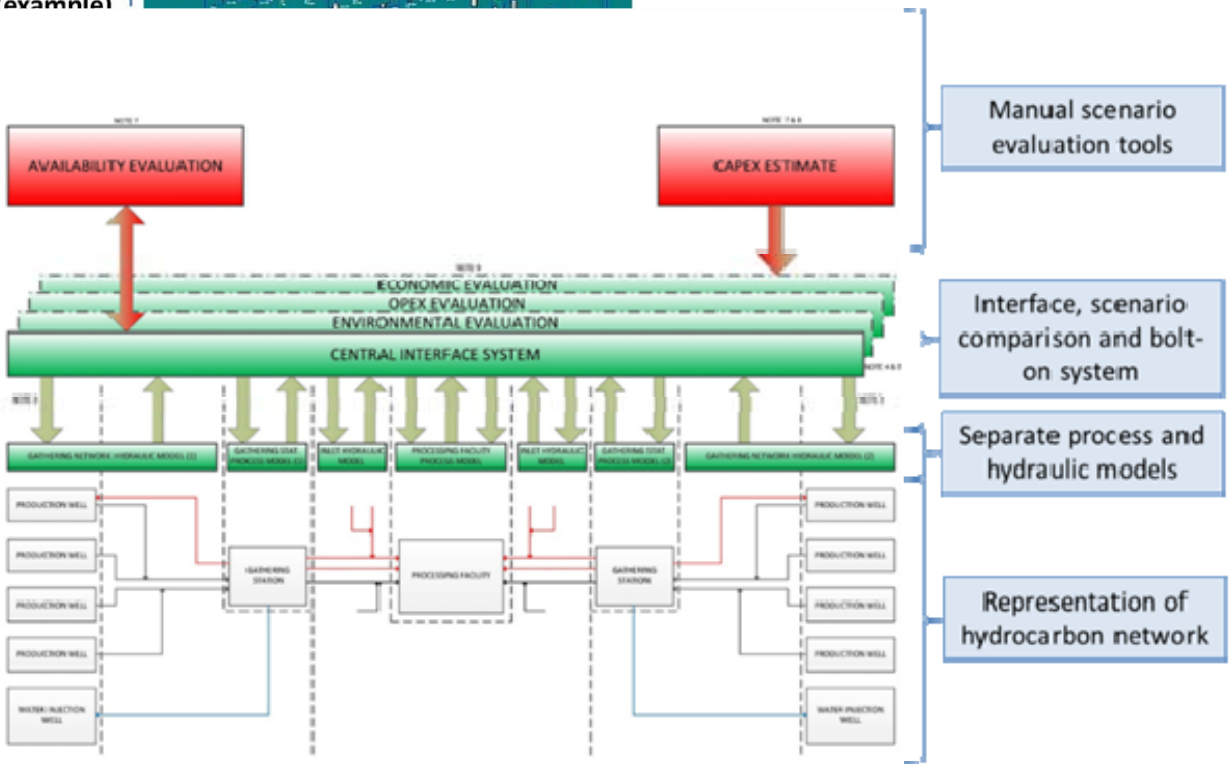


Option 2: model (Pi we

Maximus

Hydraulic model

CAPEX / OPEX Models
- Excel (fed from Hydraulic and process models)



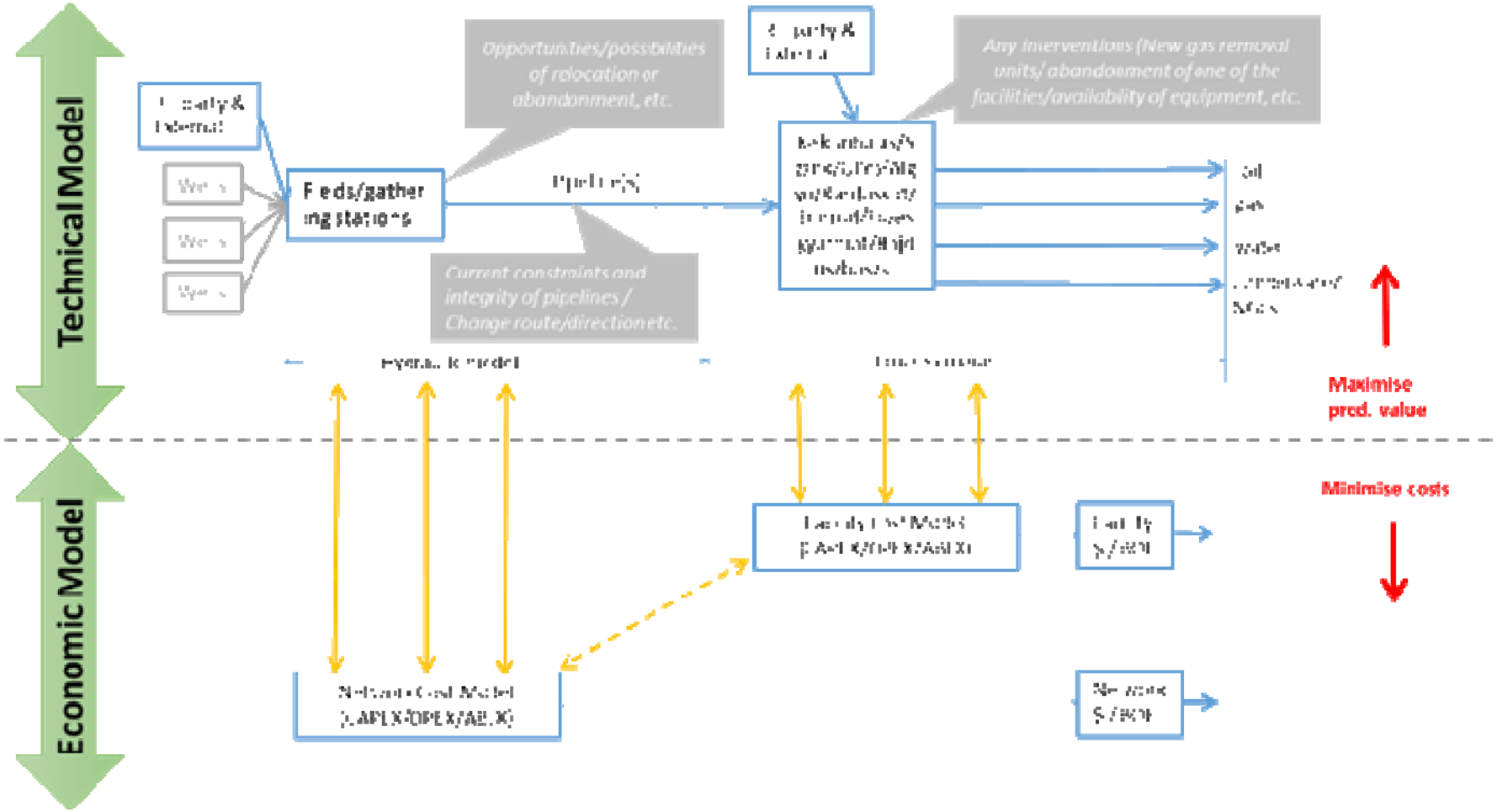
ACHIEVE GOALS → PROCESS

Think | Assess | **Select** | Define | Implement

- **Integrated model which can optimize entire system and minimize unit cost taking into consideration OPEX / CAPEX / ABEX / Exploration / Development potentials**
- MOL will perform the process and hydraulic models of all facilities and pipelines starting with Algyő area
- Develop a method for how drivers and indicators to be prioritised and captured in the integrated model?
- Establish mechanism for how the technological (process and hydraulic) and econonomic (cost, cash flow) models will be integrated
- All possible realistic combinations of scenarios and prioritise the top scenarios & opportunities for define phase

ACHVIEVE GOALS → INTEGRATED MODEL

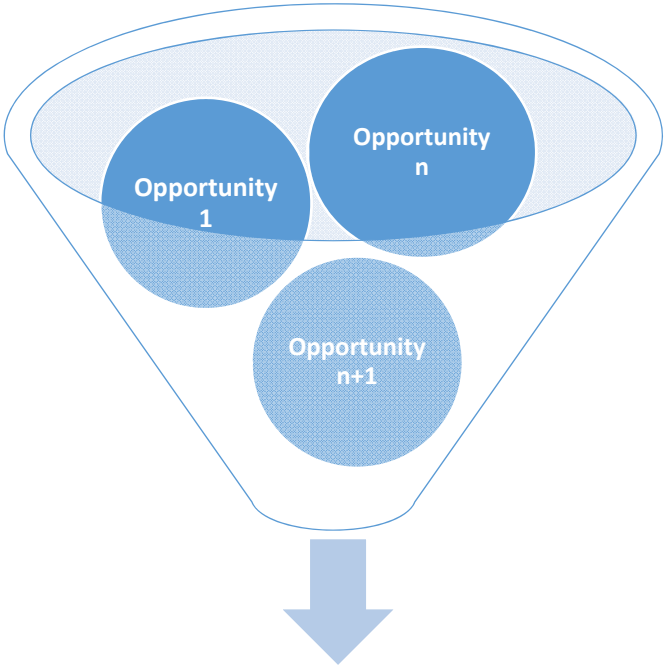
Think | Assess | **Select** | Define | Implement



ACHVIEVE GOALS → SCENARIOS

Think | Assess | Select | **Define** | Implement

- Definition and plan of action for top ranked scenarios from Select stage
- Validation Of Results
- Initiate And Develop Optimization and Simplification Projects



Definition of opportunity

THANK YOU!
QUESTIONS?