Croatian Gas Transmission Company

- Plinacro established by unbundling of gas transmission activity from INA Plc in 2001
- From 2002 100% state-owned company
- Defined as Croatian TSO (Gas Transmission System Operator) by Gas Market Act
- In charge of natural gas transmission; maintenance, managing and supervision of the entire gas transmission system and its development and construction
<table>
<thead>
<tr>
<th>Year</th>
<th>Technical Data</th>
<th>Number of Pipelines</th>
<th>Entry Points</th>
<th>Exit Points</th>
<th>Interconnections</th>
<th>Transmission (bcm of gas)</th>
<th>Max. Capacity (m³/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>1,641 km of high-pressure pipelines</td>
<td>137</td>
<td>9</td>
<td>151</td>
<td>2</td>
<td>2.95</td>
<td>560,000</td>
</tr>
<tr>
<td>2007</td>
<td>2,085 km of high-pressure pipelines</td>
<td>9</td>
<td>151</td>
<td>9</td>
<td>2</td>
<td>3.1</td>
<td></td>
</tr>
<tr>
<td>September 2011</td>
<td>2,643 km of high-pressure pipelines</td>
<td>10</td>
<td>167</td>
<td>167</td>
<td>2</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>2,775 km of high-pressure pipelines</td>
<td>10</td>
<td>172</td>
<td>172</td>
<td>2</td>
<td>4.5</td>
<td>1,200,000</td>
</tr>
</tbody>
</table>
\[ N-1_{\text{WINTER}} = \frac{\sum_{i=2}^{n} E_{-CB_i} + E_{-UGS} + E_{-P}}{X_{-DOM}} \geq 1 \]

- \( E_{CB_{CRO}} \): Smallest of all Cross-border Entry Capacities on Supply Corridor CRO
- \( E_{UGS/P_{CRO}} \): UGS and Production Entry Capacity in CRO
- \( X_{DOM_{CRO}} \): Domestic Exit Capacity required to cover winter peak demand (1 in 20) in CRO
Cross-border Entry capacity (E_CB)
UGS/Production Entry Capacity (E_UGS/P) - withdrawal
UGS Exit Capacity (X_UGS) - injection
Domestic Exit Capacity required for Demand (X_DOM)

CRO 1 Main Supply Corridor for CRO (from SI)
CRO 2 2nd Supply Corridor for CRO (from HU)
ENTRANCES BEFORE 2010

1. Rogatec (Slo)  1.5 bcm/y
2. Pula Terminal  1.5 bcm/y
3. UGS Okoli       0.6 bcm/y

N-1 in Croatia (Winter) – before 2010

\[
N - 1 = \sum_{i=2}^{n} E_{CB} + E_{UGS} + E_P \geq 1
\]

E_CBCRO - Smallest of all Cross-border Entry Capacities on Supply Corridor CRO

E_UGS/PCR- UGS and Production Entry Capacity in CRO

X_DOMCRO-Domestic Exit Capacity required to cover winter peak demand (1 in 20) in CRO

\[
N-1_{\text{WINTER}} = 0.83
\]
SLOBODNICA-DONJI MIHOLJAC-DRAVASZERDAHELY - VAROSFELD
- Diameter: DN800
- Operating pressure: 75 bar
- Total length: 300 km

- Two-way gas flow
- Min. border pressure 50 bar
- Total capacity 6.5 bcm / y
- In operation 2011
### Existing Entrances

<table>
<thead>
<tr>
<th>Entrance</th>
<th>Capacity (bcm/y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rogatec (Slo)</td>
<td>1.5</td>
</tr>
<tr>
<td>Pula Terminal</td>
<td>1.5</td>
</tr>
<tr>
<td>UGS Okoli</td>
<td>0.6</td>
</tr>
<tr>
<td>Dravaszerdahely (Hu)</td>
<td>6.5</td>
</tr>
</tbody>
</table>

### N-1 in Croatia (Winter) – EXISTING

\[
N - 1 = \sum_{i=2}^{n} \frac{E_{CB_i} + E_{UGS} + E_P}{X_{DOM}} \geq 1
\]

**E_CBCRO** - Smallest of all Cross-border Entry Capacities on Supply Corridor CRO

**E_UGS/PCR** - UGS and Production Entry Capacity in CRO

**X_DOMCRO** - Domestic Exit Capacity required to cover winter peak demand (1 in 20) in CRO

\[N - 1_{\text{WINTER}} = 1.15\]
LNGRV

- construction of installations for connection of LNG regasification vessel to the gas transmission system

1st phase:
- LNGRV
  - Installation for receiving LNGRV
  - Capacity: 1-2 bcm/y

2nd phase:
- FSU- LNG storage – on a vessel
  - Onshore Regasification - a part of the future LNG terminal
  - Capacity: 2-4 bcm/y

3rd phase:
- Construction of LNG vessel onshore in compliance with the required capacity
  - Capacity: 4-6 bcm/y

N-1 in Croatia (Winter) – INCLUDING LNGRV

\[ N-1_{\text{WINTER}} = 1.46 \]
Connection of gas transmission system of Lika and Dalmatia with TAP Project (Trans – Adriatic- Pipeline)
MP Split (HR) – Fieri (ALB) DN800 - DN1000 / 75 bar, L= 520 km
Supply with natural gas - Albania, Montenegro, Bosnia and Herzegovina and Croatia
Max capacity: 5 bcm/y
Possibility of transit of natural gas to Central and Western Europe
Possibility of reverse flow

N-1 in Croatia (Winter) – INCLUDING IAP
$N^{-1}_{\text{WINTER}} = 1.62$
N-1 in Croatia (Winter) – INCLUDING LNGRV + IAP

N-1_{WINTER} = 1,92
GAS INFRASTRUCTURE PROJECTS IN SE EUROPE
FOURTH CORRIDOR

Source: ECA, SEE Regional Gasification Study
Thank you for your attention!

Dubrovnik, 5-7 October 2011

Goran Frančić
Development Division Director