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**BOSNIA - HERZEGOVINA**

## ***USAID Energy Investment Activity***

# ***Gas network development in BiH***

Conference on Security of Gas Supply in Bosnia and Herzegovina

**Fahrudin Kulic**

Jahorina, 2 July 2018



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## CONTENTS

- Existing gas network in BiH
- Development of BiH gas network with
  - Existing interconnector
  - New east interconnector
  - North interconnector
  - South interconnector



## Gas network in BiH

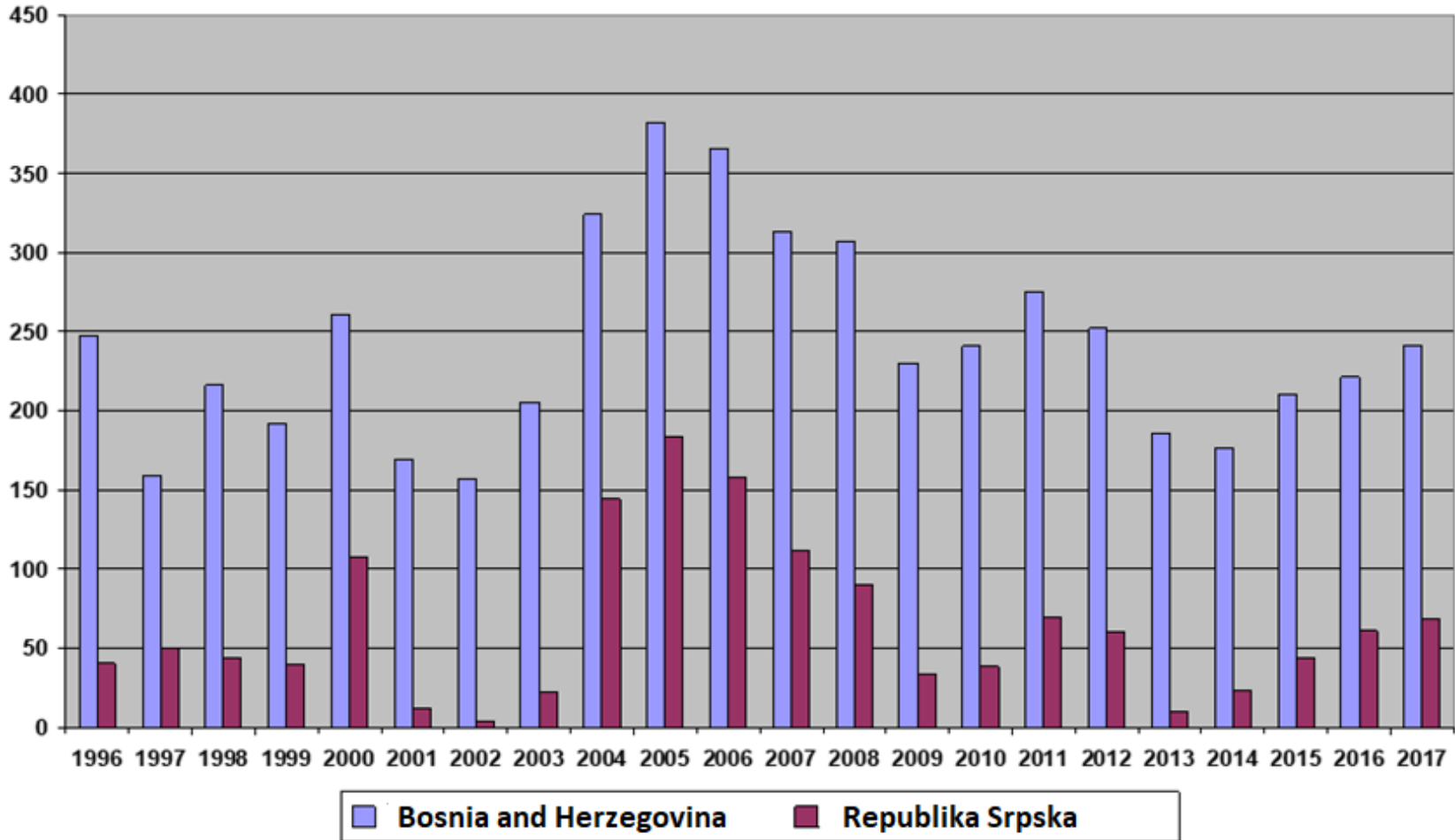


- **Single supply route, single source and 40 years old**
- Design capacity is 1.25 bcm/year (16 inch, IP Zvornik **50 bar**)
- Current capacity is 0.75 bcm/year or 83,000 cm/hour (IP Zvornik **30 bar**)



## Gas Consumption in BiH

mcm/year





## Gas supply in BiH

- **Contracted capacity 0.75 bcm/year or 83,000 cm/hour**
- Division of capacity between FBiH and RS is 60:40 (unilateral?)
- Capacity sufficient for gasification of Bijeljina and 60:40 division
- Hourly peak Consumption in Sarajevo is 70,000 cm/hour
- **Capacity insufficient for Sarajevo at 30 bar and 60:40 division**



## Gas supply security in BiH

**For security of supply TWO interconnectors are needed!**

### Options for Serbia Interconnector

1. Existing pipeline - increase pressure from 30bar to 50bar at BiH border
  - Condition of the pipeline in BiH
  - New Compressor Station
2. New pipeline along the current pipeline
3. New interconnector with Serbia (Bijeljina)

### Options for Croatia Interconnector

1. North
2. South
3. West



## Interconnectors with Serbia and RS gas network development



- # Existing directions / Interconnections
- # Planned directions / Interconnections (RS Strategy)
- Existing pipeline
- - - Planned pipeline route (RS Strategy)

Naziv projekta	
<span style="background-color: black; color: white; border-radius: 50%; padding: 2px;">1</span>	Zvornik
<span style="background-color: blue; color: white; border-radius: 50%; padding: 2px;">2</span>	Sepak - Bijeljina
<span style="background-color: blue; color: white; border-radius: 50%; padding: 2px;">3</span>	New interconnection with Serbia in Bijeljina area (Novo Selo)
<span style="background-color: blue; color: white; border-radius: 50%; padding: 2px;">4</span>	Main gas pipeline (Bijeljina - Banja Luka and beyond)
<span style="background-color: blue; color: white; border-radius: 50%; padding: 2px;">5</span>	Gasification of Trebinje from IAP
<span style="background-color: blue; color: white; border-radius: 50%; padding: 2px;">6</span>	Gasification of Gornje Podrinje
<span style="background-color: blue; color: white; border-radius: 50%; padding: 2px;">7</span>	Slobodnica - Brod (TRA-N-066)



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## Existing interconnection BiH - Serbia

**Inspect and repair pipeline to increase pressure to 50bar**

### **PROs**

- Likely the lowest cost - to be confirmed by test results

### **Challenges**

- New Compression Station
- Srbijagas to inspect and repair or replace its pipeline





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## Existing interconnection BiH - Serbia

### New pipeline next to existing

#### PROs

- Likely the second lowest cost alternative for BiH

#### Challenges

- New Compression Station
- Srbijagas to inspect and repair or replace its pipeline



## New interconnection BiH - Serbia

### PROs

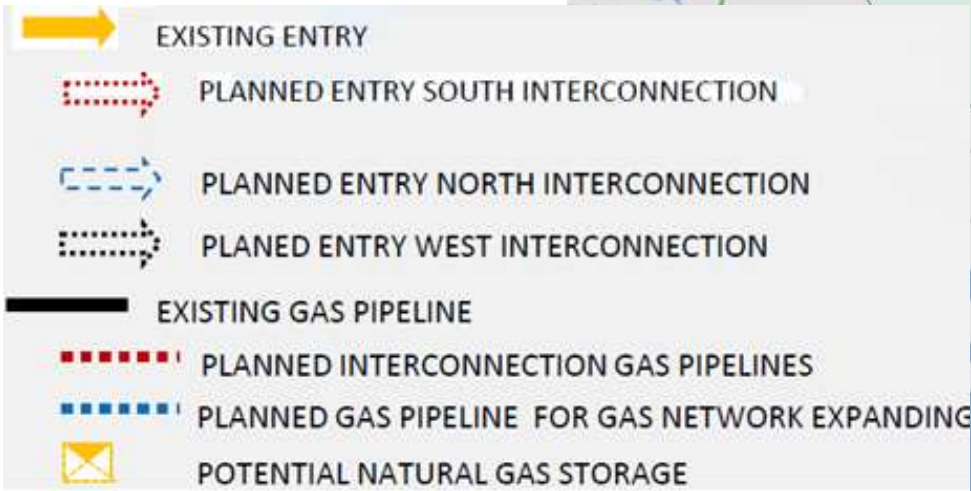
- Increase in capacity allows for expansion of BiH gas network

### Challenges

- High cost - Srbijagas to construct **new** pipeline to BiH
- Supply still only from Hungary or also from Bulgaria?



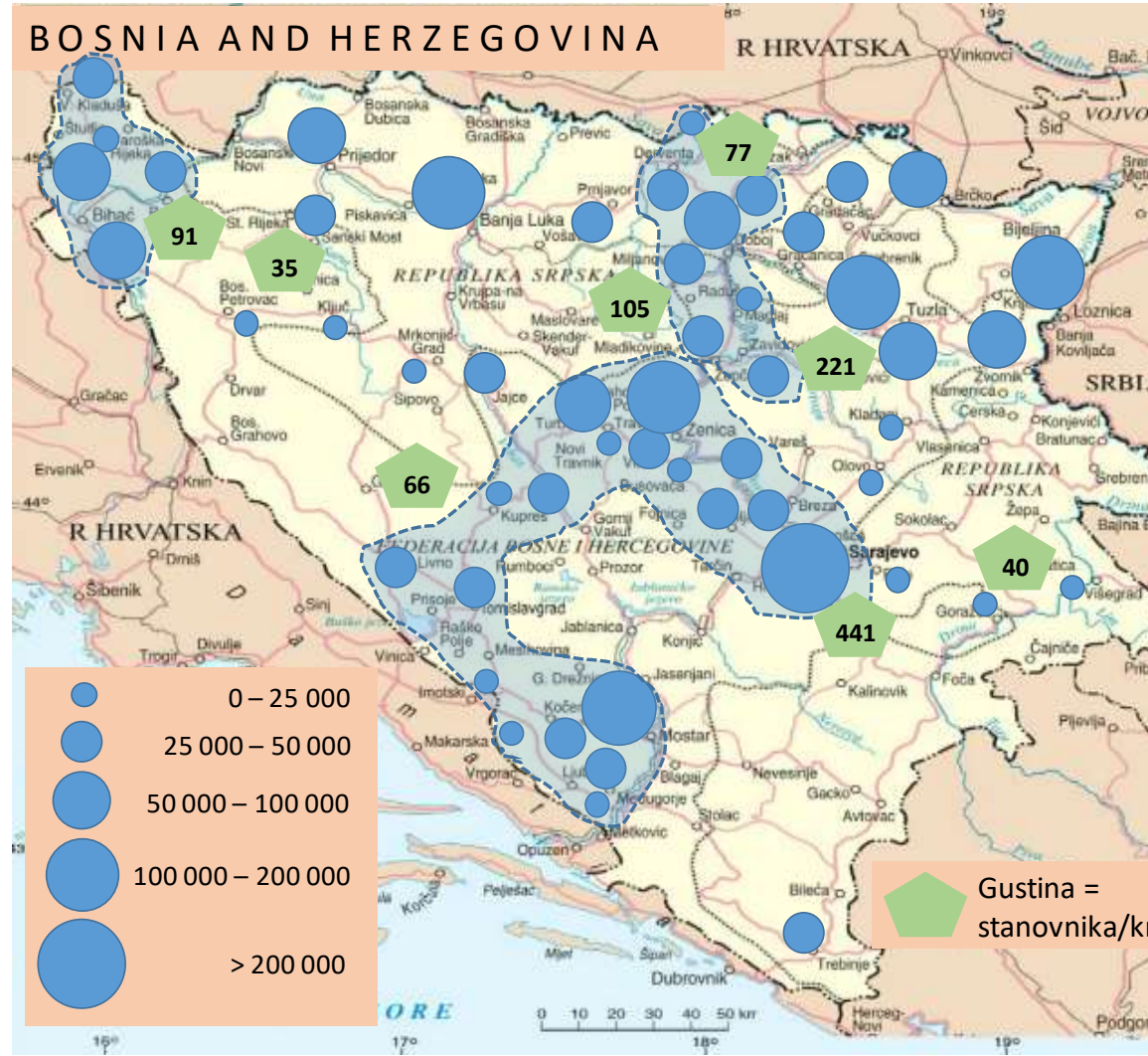
## Interconnectors with Croatia



Source: BH GAS



## North Interconnection BiH - CRO



Data source: BH Agency for Statistics



## North Interconnection BiH - CRO

<b>Tech. Info:</b>	<b>Length</b>	<b>Bi-directional</b> Main Pipeline (Sl. Brod – Dobož – Maglaj – Zenica): 142km Pipeline in Croatia: 6 km <b>Total length: 148 km</b>
	<b>Diameter</b>	BiH: 500 mm (20 inch) Croatia: 700 mm (28 inch)
	<b>Capacity</b>	Entry/Exit Capacity: 44/35 GWh/day (1.6/1.3 bcm/year)
<b>Invest. Cost</b>	<b>Estimated EUR 94 million</b>	
<b>Construction Start - End</b>	2021-2023 (TYNDP 2017, PECE/PMI 2018 Application)	



## North Interconnection BiH - CRO

<b>Current Status (BiH)</b>	<p>Pre-Feasibility Study for Brod – Zenica, BH-Gas – INA, 2006 WBIF grant for Feasibility Study</p> <ul style="list-style-type: none"><li>• 1 million EUR in 2011</li><li>• Cancelled in 2013 – no support from RS</li></ul>
<b>National Network Development Plan</b>	<ul style="list-style-type: none"><li>• Strategic Plan and Program of FBiH Energy Sector Development, 2009</li><li>• Strategy of Energy Sector Development of RS until 2030, (Alternative option to Sava pipeline)</li><li>• Framework Energy Strategy of BiH until 2035, 2017 (low priority in RS)</li></ul>
<b>TYNDP/PECI/PMI</b>	<p>TYNDP 2015 and 2017 PECI 2013 PECI/PMI 2018 Application</p>



## North Interconnection BiH - CRO

### PROs

- Close proximity to Croatian transport pipeline hub
- Existing large Consumer (Brod refinery – 70 mcm/year)
- Runs through areas of higher population density and larger towns (potential industrial and household Consumers)
- Competition in gas supply

### Challenges

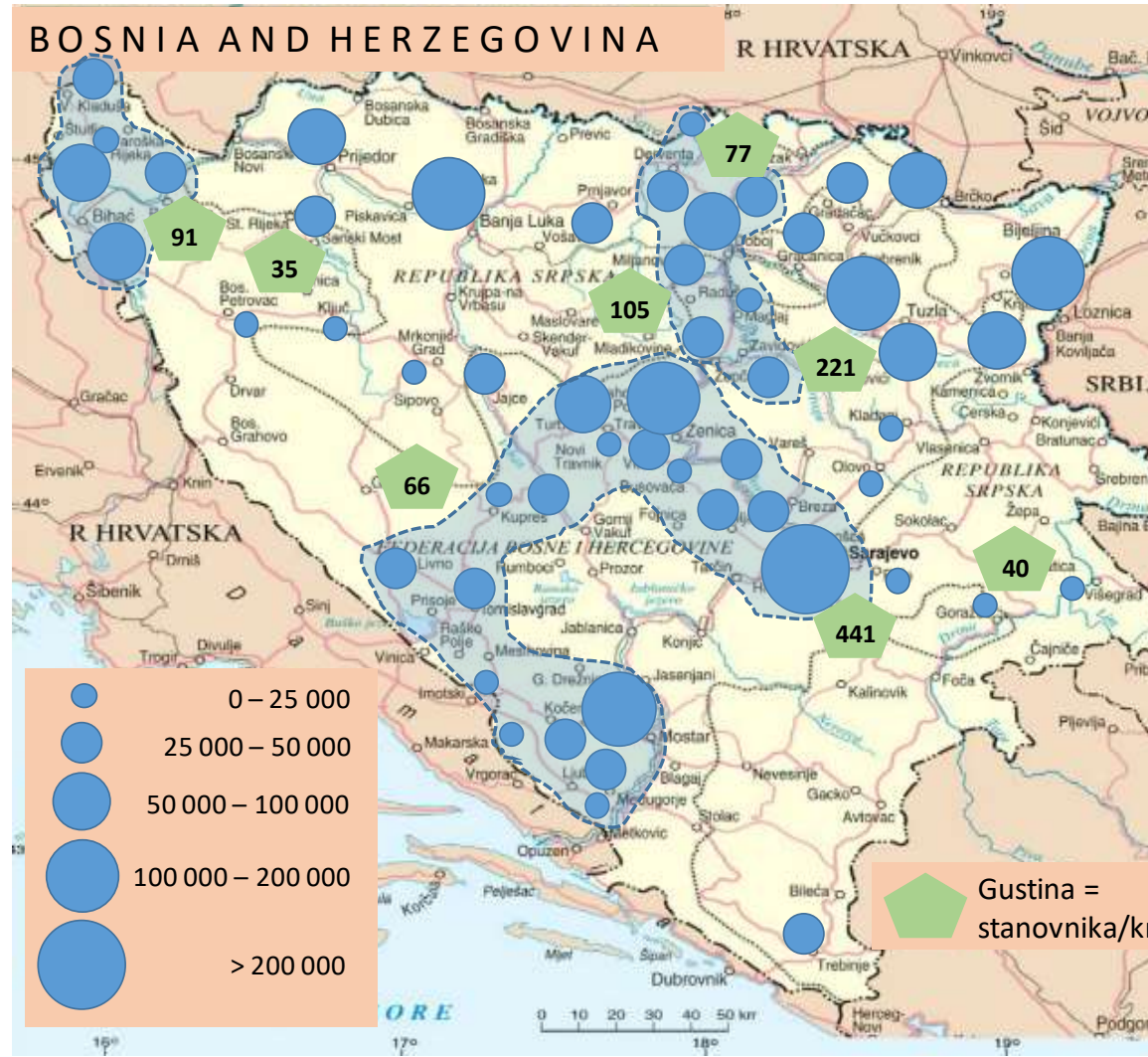
- Brod refinery to be supplied directly from Croatia
- Low priority for RS



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## South Interconnection BiH - CRO



Data source: BH Agency for Statistics





## South Interconnection BiH - CRO

<b>Tech. Info:</b>	Length	<p><b>Bi-directional</b></p> <p>Main Pipeline (Border – Posušje – Travnik): 114km</p> <p>Branch to Mostar: 48 km</p> <p>Pipeline in Croatia: 21.8 km</p> <p><b>Total length: 183.8 km</b></p>
	Diameter	BiH: 500 mm (20 inch)
	Capacity	Entry/Exit Capacity: 75/38 GWh/day (2.7/1.4 bcm/year)
<b>Invest. Cost</b>	<p><b>BiH: 100 mil. EUR Total</b></p> <p>Main Pipeline 71.5 mil. EUR</p> <p>Mostar Branch 28.8 million EUR</p> <p><b>Croatia: 16 million EUR</b></p> <p><b>Croatia without IAP: 64 million EUR</b></p>	
<b>Construction Start - End</b>	2021-2023 (TYNDP 2017, PEI/PMI 2018 Application)	



## South Interconnection BiH - CRO

<b>Current Status (BiH)</b>	<ul style="list-style-type: none"><li>• Pre-Feasibility Study of Gasification of Hercegovina-Neretva Canton, West Herzegovina Canton and Livno Canton, EIHP 2009</li><li>• Pre-Feasibility Study, COWI IPF Consortium, 2013</li><li>• Financial Viability Analysis and Cost Benefit Analysis, Mott MacDonald CONNECTA Consortium, 2018</li></ul>
<b>National Network Development Plan</b>	Strategic Plan and Program of FBiH Energy Sector Development, 2009 Framework Energy Strategy of BiH until 2035, 2017 (FBiH) Project of Strategic Importance in FBiH (No. 853/2017)
<b>TYNDP/PECI/PMI</b>	TYNDP 2015 and 2017 PECI 2013 PECI/PMI 2018 Application



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## South Interconnection BiH - CRO

### PROs

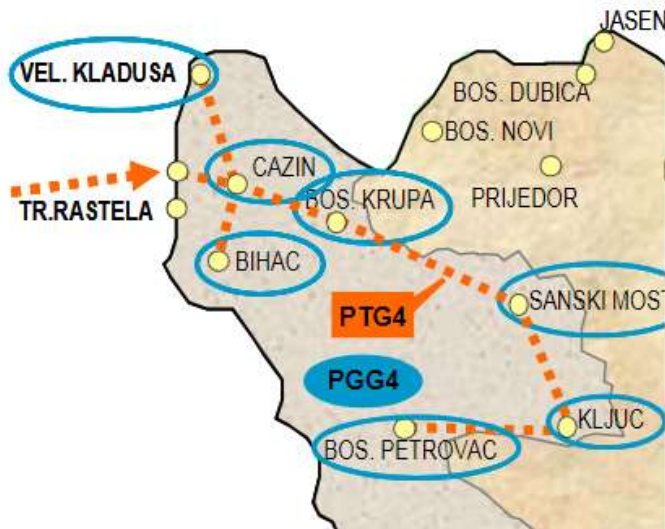
- If IAP is built – direct access to Caspian gas
- Single company ownership – clear responsibility for maintenance
- Competition in gas sources
- CBA resulted in positive financial parameters

### Challenges

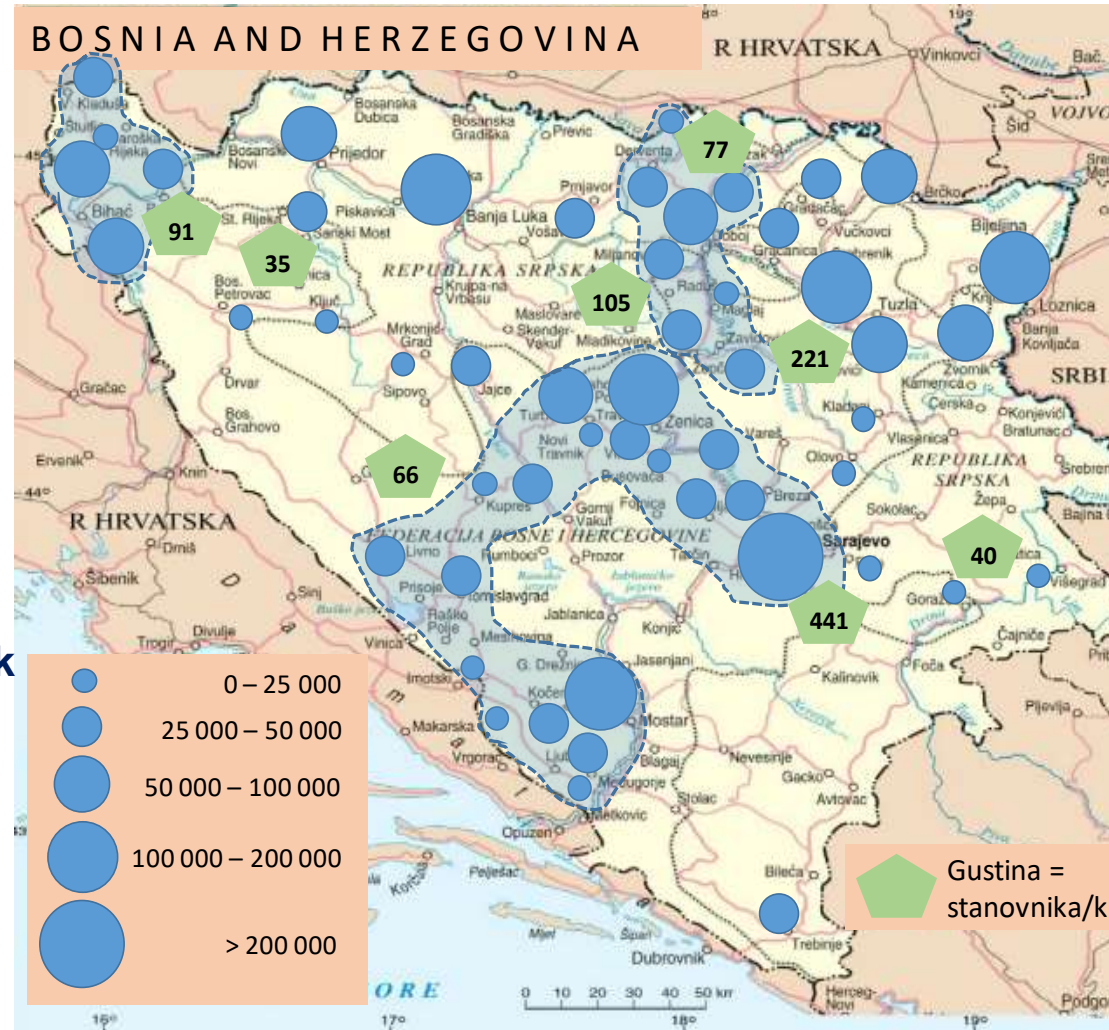
- No existing Consumer near main pipeline - expensive branch to Mostar
- Assumed consumption of 543 mcm in 2039



## West Interconnection BiH - CRO



Supply of gas to Canton Una-Sana  
No connection to existing gas network





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## Options for BiH gas network development

Select **two** of four options for connecting with existing network:

- East – existing interconnector
- East – new interconnector
- North – interconnector
- South – interconnector



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**Thank you for your attention!**

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