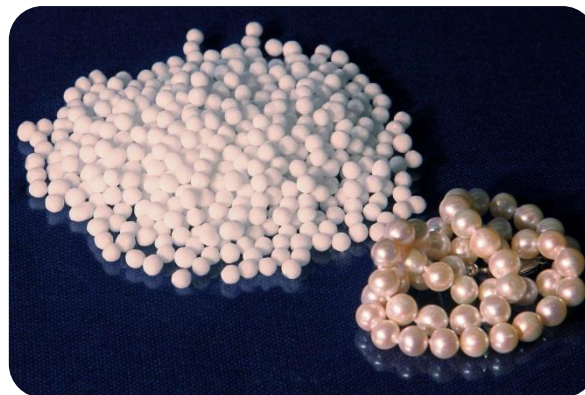




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«Research and design institute of urea  
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(JSC «НИИХ»)

## What Are the Advantages of Urea Production?



**Urea – high efficiency nitrogen fertilizer with 46, 2% nitrogen content.**

**Urea is being manufactured according to GOST 2081.**

**Two urea grades are produced: grade A and grade B.**

**Urea  
application**

**Chemical  
industry (grade A)**

**Agriculture**

**Animal farming  
(grade A)**

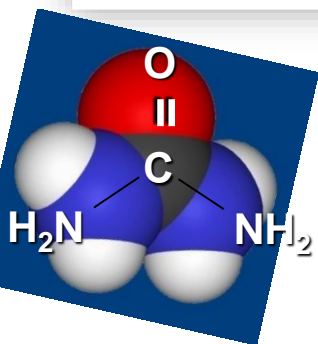
**Plant cultivation  
(grade B)**

- ✓ Raw material for urea- aldehyde resins (synthesis of melamine, hydrazine and other products, including pharmaceuticals)

- ✓ use of urea in the petroleum for purification of oils and motor fuels from paraffin

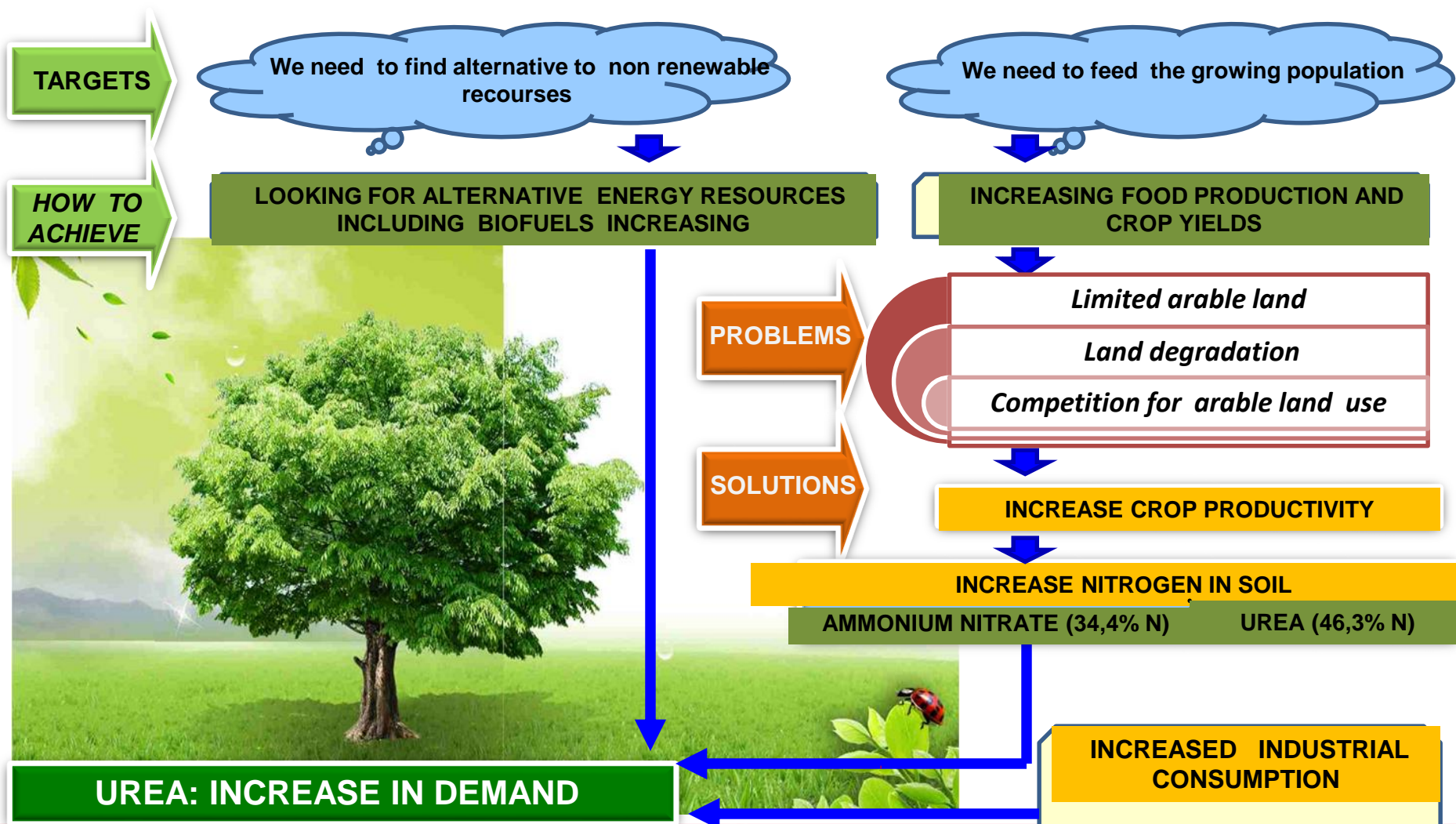
- ✓ Natural alternative to protein in livestock feeds

- ✓ Universal fertilizer suitable for practically all kinds of soils and crops
- ✓ Suitable for FOLIAR application

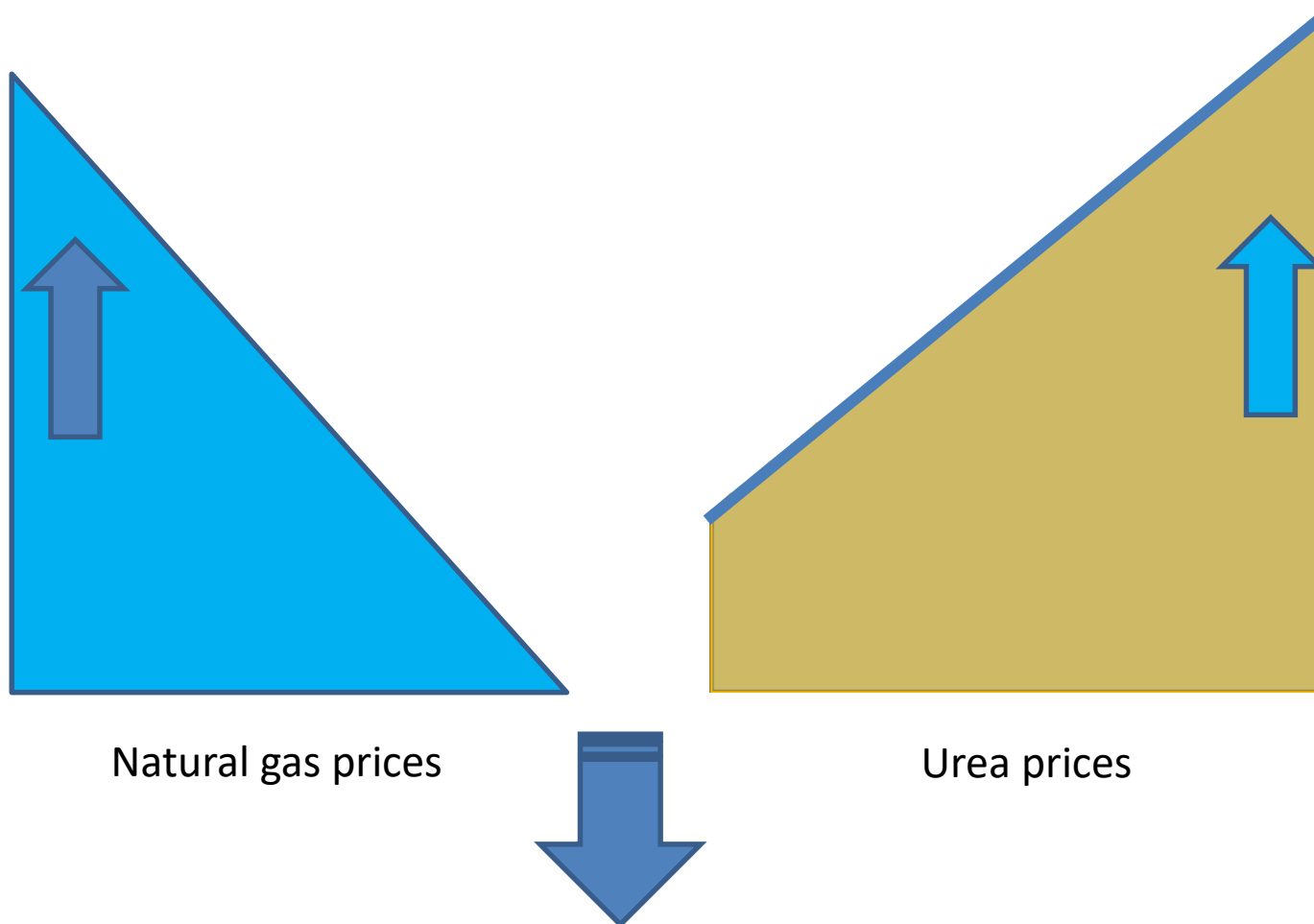


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# The phenomenal growth of global urea consumption



# Factors Determining Profitability of Urea Production



**Production profitability – up to 90%**



# Russia: strategically advantageous location

*The important advantages of launching new urea production facilities on the territory of Russia*



- Availability of rich and effective raw material resources
- Natural gas at lower price
- Well-developed infrastructure
- Large-scale logistics network
- Direct access to the sea
- Government support
- Predictable political environment



Natural gas reserves in the world

**Shale gas:**  
an alternative energy

## Disadvantages:

- difficult to reach compared with natural gas
- uncontrolled methane gas emissions
- degradation of groundwater quality
- high production cost



Political instability in the Middle East

Reserves  
300000 43301719562862



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# Growing demand attracts increase in urea output in Russia and former USSR countries

## TASK

### RESTORING SOIL FERTILITY AFTER NATURAL DISASTERS



## SOLUTION

### UREA APPLICATION RATE INCREASE



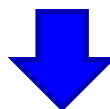
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# Growing demand attracts increase in urea output in Russia and former USSR countries



Natural gas availability



**TASK**

**ADVANCED GAS PROCESSING**



**SOLUTION**

**CONSTRUCTION OF NEW COMPLEX FERTILIZERS,  
ADBLUE, MELAMINE PRODUCTION UNITS**



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# Growing demand attracts increase in urea output in Russia and former USSR countries

## TASK

## MAINTAINING AND/OR INCREASING EXPORT VOLUMES

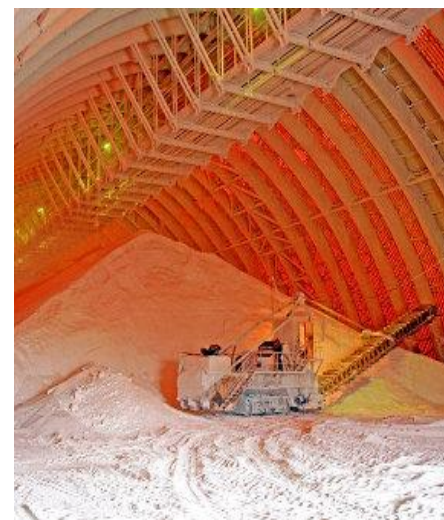
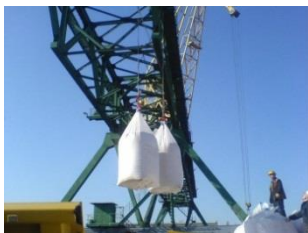
### 1. Active position

of companies on promising export markets:

- countries with high domestic gas prices and/or having no possibility to extract gas
- countries with low crop yields
- countries with low application rate of N fertilizer
- countries with fast growing population
- countries exporting agricultural products
- current importers of Russian fertilizers

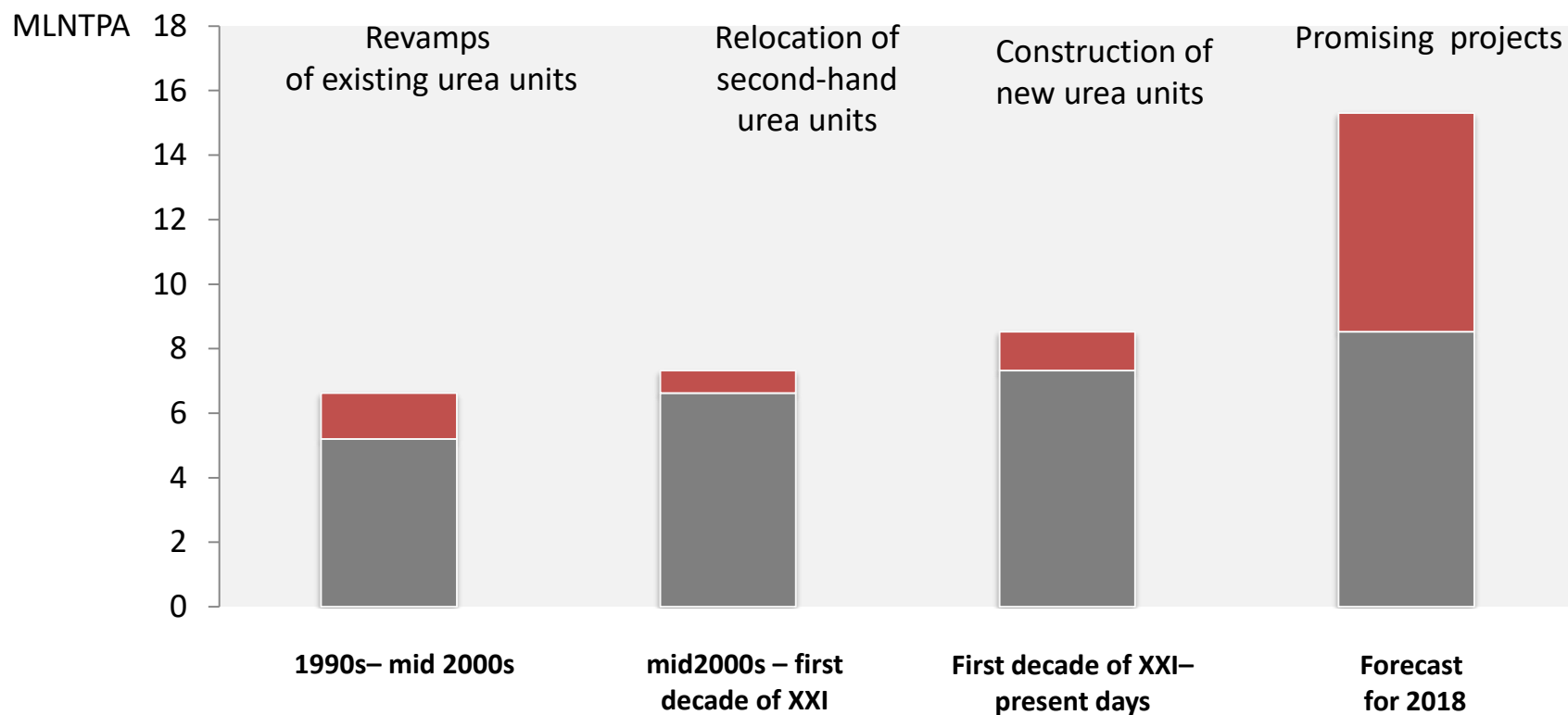
### 2. Reducing logistics cost in a total cost of urea production

(increasing rail car fleet sizing, construction of new port terminals etc)

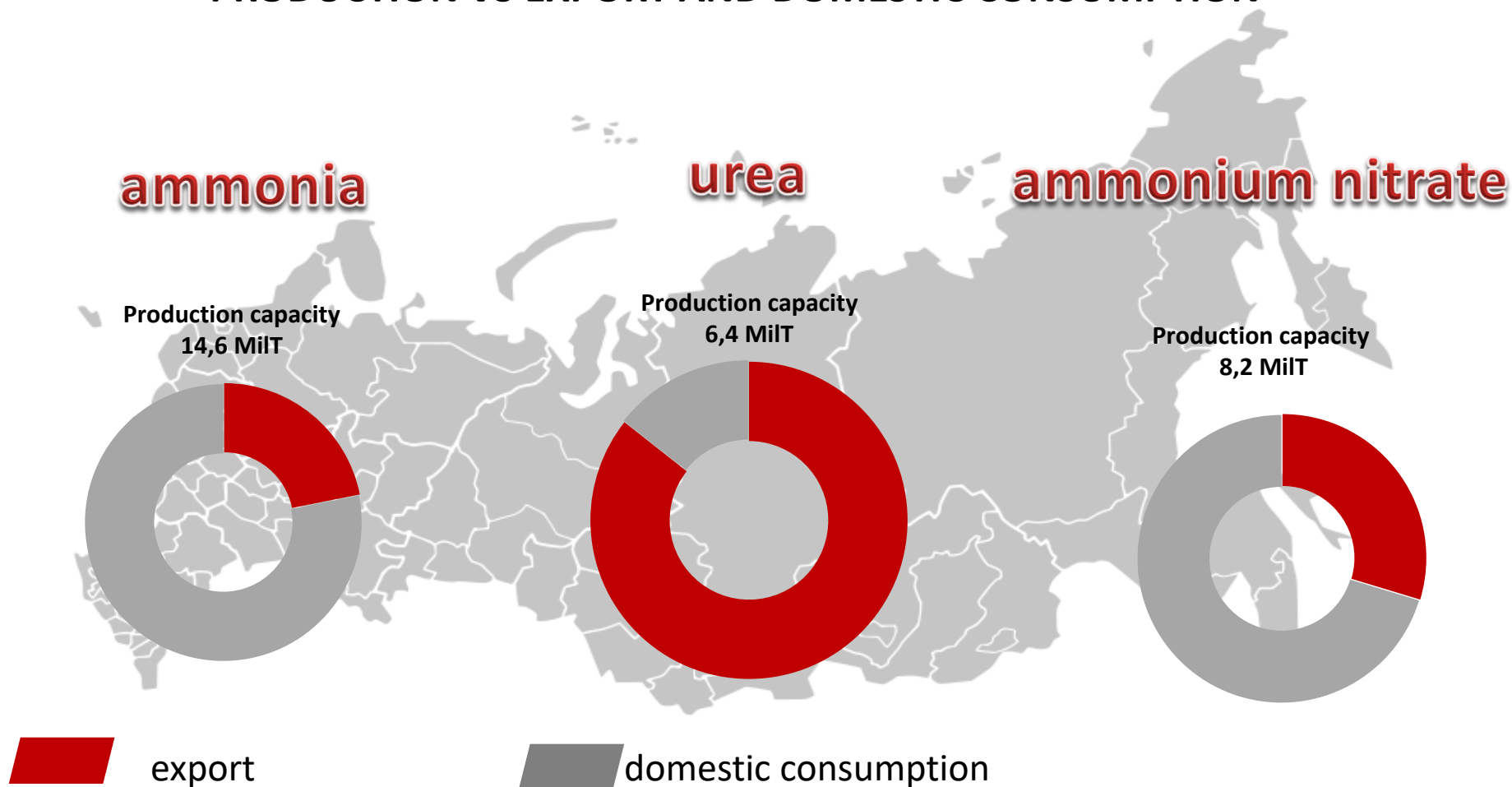


# Evolution of urea industry in Russia

## Capacity increase due to



# Russian nitrogen market in 2014: PRODUCTION VS EXPORT AND DOMESTIC CONSUMPTION



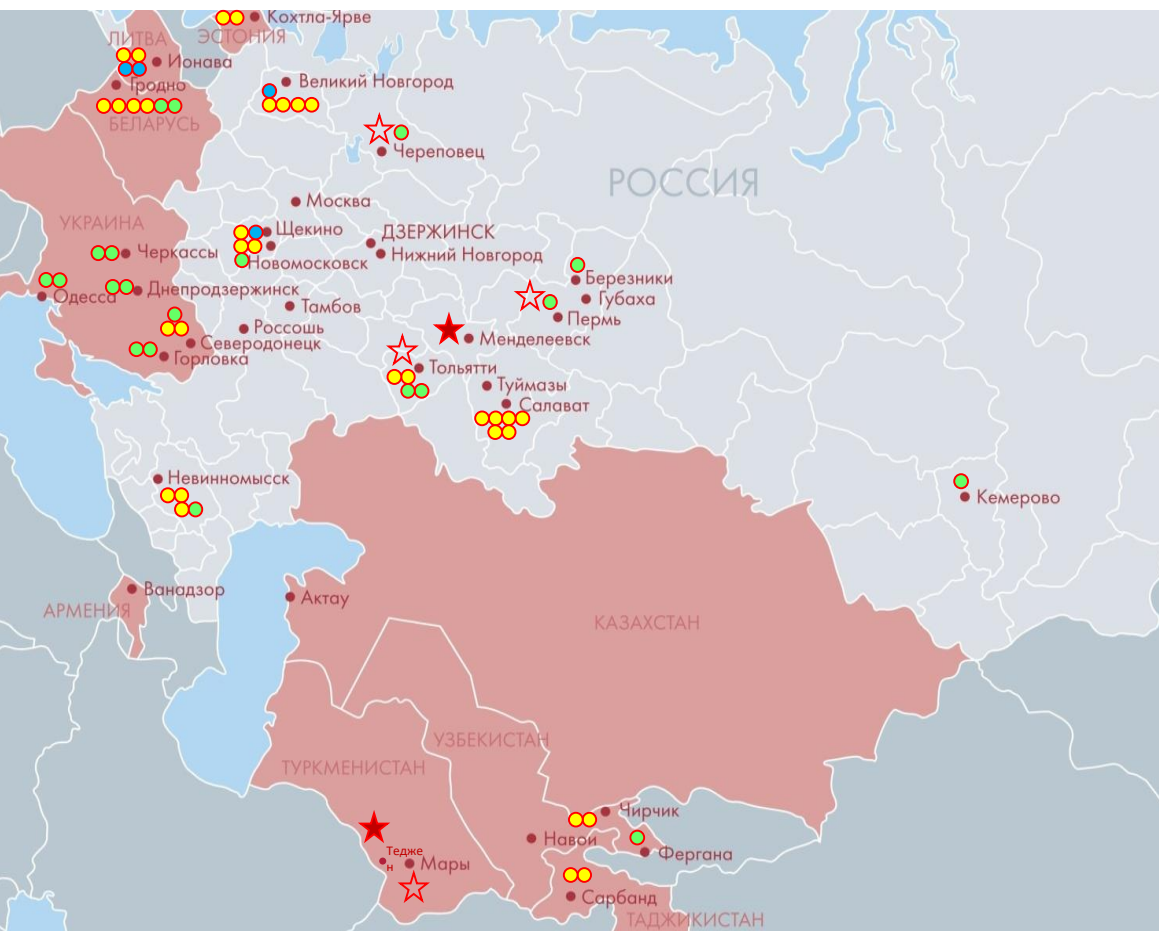
Source: IFA, AFA



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# Urea production units



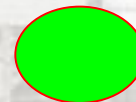
Started up in 60s – 70s

32



Started up in 80s

20



Relocated second-hand units  
restarted in 2007-2012

4



Started up in 2005-2014

2



Under construction

2



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# New urea production facilities in Russia and CIS countries constructed with NIIK participation



«Cherepovetsky Azot»  
Urea plant,  
2008-2012



«Acron»  
Veliky Novgorod, 2007-2012  
Urea plant based on second- hand  
equipment  
from Manfredonia (Italie)



New urea plant based on second-hand  
equipment  
at AB «Achema» (Lithuania, Ionava)  
Capacity=500 TPD-based on a second- hand  
unit relocated from Angarsk city, 2006-2007  
Capacity= 1000 TPD– based on a second-hand  
unit relocated from Manfredonia (Italie), 2008-  
2010

«Ammoni»  
«Ammonia- Methanol- Urea»  
complex 2010-2015



«NAK Azot»

Urea plant based on second-  
hand equipment  
from Panchevo (Serbia),  
2007-2010

