

# **Storage Specification Haidach Underground Storage Facility**

**astora GmbH**  
Karthäuser Straße 4  
34117 Kassel, Germany

(hereinafter referred to as "**astora**")

## Contents

Article 1	Introduction .....	3
Article 2	Storage Services .....	3
Article 3	Storage Services Fee .....	5
Article 4	Basic Storage Tariff .....	5
Article 5	Adjusting the Storage Tariff .....	6
Article 6	Long-term Factors .....	6
Article 7	Short-term Factors .....	7
Article 8	Seasonality Factors .....	7
Article 9	Fee for Exceeding the Storage Capacities .....	8
Article 10	Tariff for Exceeding the Storage Capacities .....	8
Article 11	Rounding procedure .....	8
Article 12	Technical Limitations .....	8
Article 13	Injection and Withdrawal Curves .....	8
Article 14	Delivery Points .....	10
Article 15	Gas Quality Specifications .....	11
Article 16	Changes in the Storage Specification .....	11

## Article 1 Introduction

1. The **Storage Specification** for the Haidach **Storage Facility** defines all the details required to enable **astora** to provide **Storage Services** in the Haidach **Storage Location**. The Austria-Bavaria-Gas-Pipeline (ABG) with the length of 39 km which connects the Haidach **Storage Facility** with the SÜDAL pipeline system of bayernets GmbH, München and in future with the pipeline system of Open Grid Europe GmbH, Essen in the Burghausen region is also an integral part of the Haidach **Storage Location**.
2. The definitions for the storage of **Gas** contained in the **General Terms and Conditions for Storage Access** shall apply. Terms used in the singular also include the plural and vice versa, assuming this has not been expressly agreed otherwise or is obvious from the respective situation.
3. Upon the conclusion of a **Storage Services Agreement** the **Storage Specification** of the **Storage Location** on which the **Storage Services Agreement** is based shall form an integral part of the **Storage Services Agreement**.

## Article 2 Storage Services

### Article 2.1 astora-pack

1. The **astora-pack Storage Service** shall be a **Bundled Storage Service** with a minimum term of one (1) **Year**. In case **astora-pack** is only available for a period within a **Storage Year** less than the aforementioned term, **astora** shall be entitled to deviate from this minimum term.
2. At Haidach **astora-pack** shall comprise the following **Storage Capacities**:
  - a) **Injection rate**: 10.00 kWh/h and
  - b) **Withdrawal rate**: 10.00 kWh/h and
  - c) **Working gas volume**: 22,000.00 kWh
3. The minimum quantity of **astora-pack** shall be 500 bundles. In case **astora-pack** is only available for a quantity less than the aforementioned quantity, **astora** shall be entitled to deviate from this minimum quantity.
4. The availability of **astora-pack** shall be subject to the limitations of the applicable **Injection** and **Withdrawal Curves** according to Article 13.

## Article 2.2 **astora-add**

1. The **astora-add Storage Service** shall be an **Unbundled Storage Service** with a minimum term of one (1) **Storage Day** which **Storage Customers** can contract in addition to **astora-pack**.
2. For the Haidach **Storage Location** the following **Storage Capacities** of **astora-add** have been offered in Phase II:
  - a) **Injection rate:** 72,550 kWh/h and
  - b) **Withdrawal rate:** 442,550 kWh/h and
  - c) **Working gas volume:** 1,596,078,000 kWhThese **Storage Capacities** can be booked independently of each other and in any combination.
3. The availability of **astora-add** shall be subject to the limitations of the applicable **Injection** and **Withdrawal Curves** according to Article 13.

## Article 2.3 **astora-part**

1. The short-term and **Interruptible Storage Service astora-part** shall be a **Bundled Storage Service** with a minimum term of one (1) **Month** and a maximum term of two (2) **Years**. The service can be interrupted according to Section 4.
2. At Haidach **astora-part** shall comprise the following **Storage Capacities**:
  - a) **Injection rate:** 10.00 kWh/h and
  - b) **Withdrawal rate:** 10.00 kWh/h and
  - c) **Working gas volume:** 4,000.00 kWh
3. The minimum quantity of **astora-part** shall be 100 bundles. In case **astora-part** is only available for a quantity less than the aforementioned quantity, **astora** shall be entitled to deviate from this minimum quantity.
4. For the **astora-part Storage Service astora** may interrupt the **Injection** and/or **Withdrawal Rate** of the **Storage Customer** completely or partially with at least three (3) **Hours** notice.
5. In case of interruption the **Storage Customer** shall be refunded the **Storage Services Fee** for the interrupted usage time on a pro rata basis; however, the refund shall be limited to 50% of the **Storage Services Fee**. This may be offset against the monthly payments.
6. The limitation of the **Injection** and/or **Withdrawal Curve** according to Article 13 shall not apply.

### Article 3 Storage Services Fee

1. The **Storage Customer** shall be obligated to pay the respective **Storage Services Fee** for the **Storage Capacities** made available by **astora**. The claim to payment of this **Storage Services Fee** shall arise at the start of the **First Utilisation Day** of the respective **Storage Services Agreement**.
2. The **Storage Tariff** that applies to the **Storage Services Fee** shall be calculated on the basis of the **Basic Storage Tariff** according to Article 4 and the provisions defined in Article 5 hereunder.
3. To determine the **Storage Services Fee** the number of contracted **Storage Services** shall be multiplied by the **Storage Tariff** according to Section 2 and a grand total of all **Storage Services** is formed.
4. In case **Short-term-** or **Long-term Factors** should apply, the **Storage Services Fee** calculated according to Section 3 shall be multiplied by the respective factors according to Article 6 and Article 7.
5. For **Storage Periods** less than one (1) **Year** the annual **Storage Services Fee** calculated according to Section 3 and Section 4 shall be divided by twelve (12) in order to calculate the **Storage Services Fee** per **Month**. In order to calculate the **Storage Services Fee** per **Storage Day** the **Storage Services Fee** per **Month** according to sentence 1 shall be divided by thirty (30).
6. In case seasonality factors according to Article 8 should apply, the **Storage Services Fee** calculated according to Section 5 shall be multiplied by the respective factors.

### Article 4 Basic Storage Tariff

1. The **Basic Storage Tariff** for **astora-pack** according to Article 2.1 shall be:  
€ 142.95 per **Year** per bundle.
2. The **Basic Storage Tariff** for **astora-add** according to Article 2.2 shall be:
  - a) **Injection Rate:** € 5.07 per kWh/h/a
  - b) **Withdrawal Rate:** € 7.10 per kWh/h/a
  - c) **Working Gas Volume:** 0.20 ct/kWh/a
3. The **Basic Storage Tariff** for **astora-part** according to Article 2.3 shall be:  
€ 129.77 per **Year** per bundle.
4. All the prices listed here are net prices; any statutory turnover tax that is due shall be charged separately at the applicable tax rate.

## Article 5 Adjusting the Storage Tariff

1. Based on the **Basic Storage Tariff** according to Article 4 the **Storage Tariff** that applies to billing and payment shall be adjusted on April 1 every year according to the following formula:

$$E = E_0 \times \left( 0.70 + 0.15 \times \frac{I}{I_0} + 0.15 \times \frac{L}{L_0} \right)$$

In this formula the terms mean:

$E =$  **Storage Tariff** in €/year or €/month.

$E_0 =$  **Basic Storage Tariff** as per Article 4.

$I =$  Average annual value of the Capital Goods Price Index in the calendar year preceding the adjustment date.

The Capital Goods Price Index is published in Series 17 of the German Federal Statistical Office; Prices; Series 2; – Index der Erzeugerpreise gewerblicher Produkte (Inlandsabsatz) (Producer Price Index (domestic sales)).

$I_0 =$  102.4 points = Value of Index (2005 = 100) in base year 2009.

$L =$  Average annual value of the Contractual Wage Index in the Energy Industry in the calendar year preceding the adjustment date.

The Contractual Wage Index for the Energy Industry (together) is published in Series 16 of the German Federal Statistical Office; Series 4.3; Index der tariflichen Stundenverdienste im produzierenden Gewerbe und im Dienstleistungsbereich; Basis 2005 = 100; Früheres Bundesgebiet; WZ 35 (Contractual wage index in industry and service business, former federal territory).

$L_0 =$  111.6 points = Value of Index (2005 = 100) in base year 2009.

2. In case any of the quotations or indices mentioned under Section 1 will not be published anymore or in an altered way being incomparable to the way in which they have been published before, **astora** shall - from the time, when the publication in the original way was suspended - be entitled to determine quotations or indices reflecting the economic keynote of the rule for adjusting the **Storage Tariff** as precisely as possible.

## Article 6 Long-term Factors

In Haidach in case of a long-term booking of **Storage Capacities** in the form of the offered **Storage Services astora-pack and astora-add** as per Article 2, the following **Long-term Factors** shall apply:

contract duration	factor
≥ 24 months	0.9850
≥ 36 months	0.9700
≥ 48 months	0.9550
≥ 60 months	0.9400
≥ 72 months	0.9250

#### Article 7 Short-term Factors

For booking the **astora-add** or **astora-part Storage Services** in the Haidach **Storage Location** with duration of less than one **Year** the following **Short-term Factors** shall apply:

contract duration	factor
≥ 6 months	1.050
≥ 3 months	1.100
≥ 1 storage day	1.200

#### Article 8 Seasonality Factors

For booking the **astora-add Storage Service** with duration of less than one **Year** the following seasonality factors shall apply for certain **months** depending on the type of single service:

- a) **Injection Rate** from April to September: 1.1000
- b) **Withdrawal Rate** from October to March: 1.2000
- c) **Working Gas Volume** from July to December: 2.0000

## Article 9 Fee for Exceeding the Storage Capacities

1. The ***Fee for Exceeding the Storage Capacities*** will be calculated daily by using the ***Tariff for Exceeding the Storage Capacities*** according to the following Article 10 on the basis of the maximum hourly volume which exceeds 100% of the ***Storage Capacities*** per ***Storage Day***.
2. In the case that the ***Storage Customer's Storage Level*** is less than zero (0), **astora** shall be entitled but not be obliged to buy and to inject ***Natural Gas*** which is needed for balancing the ***Storage Customer's Storage Account***. The ***Storage Customer*** shall be obliged to pay 150% of the purchase price as well as all the related costs.

## Article 10 Tariff for Exceeding the Storage Capacities

1. The ***Tariff for Exceeding the Storage Capacities*** shall be:
  - a) ***Injection rate***: 2.5 €/(MWh/h)/d
  - b) ***Withdrawal rate***: 2.5 €/(MWh/h)/d
2. All the prices listed here are net prices; any statutory turnover tax that is due shall be charged separately at the applicable tax rate.

## Article 11 Rounding procedure

To round the calculations of this ***Storage Specification*** up or down the intermediate calculations shall be rounded up or down to four (4) decimal places and the final results to two (2) decimal places. If the fifth (5th) or third (3rd) decimal place respectively should be five (5) or more, the sum shall be rounded up, if it is less than five (5), it shall be rounded down.

## Article 12 Operations

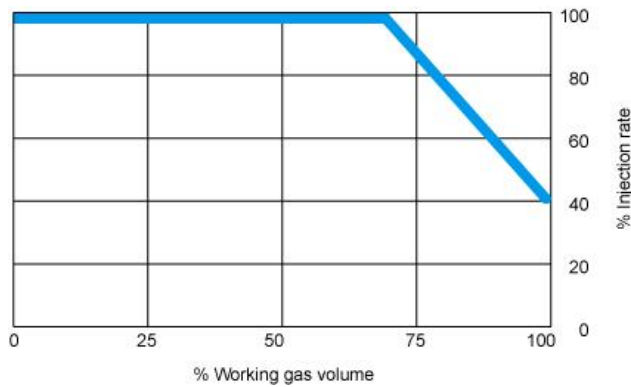
In the Haidach ***Storage Location*** the time required to process a ***Renomination*** shall be two (2) hours.

## Article 13 Injection and Withdrawal Curves

1. The usage of the ***Storage Services*** as per Article 2.1 and Article 2.2 is limited by the ***Injection and Withdrawal Curves***.
2. The ***Injection and Withdrawal Curves*** of the Haidach ***Storage Facility*** assumed shall apply herein in combination with the ***Storage Services*** as per Article 2.1 and Article 2.2 also for the corresponding ***Storage Services Agreements***.
3. If a percentage of the stored ***Working Gas Volume*** as per Sections 4 and 5 should be reached, **astora** may lower the ***Injection*** or ***Withdrawal Rate*** to the percentage specified according to Sections 4 and 5.



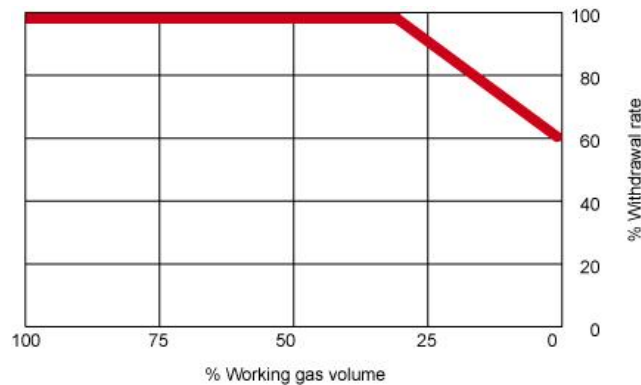
4. The **Injection Curve** shows the **Injection Rates** as a function of the **Storage Customer's Working Gas Volume** which it shall be entitled to use.



The available **Injection Rates** of the **Storage Customer** (IR) in case a **Customer's Storage Level** of **Working Gas Volume** (WGV) exceeds 70% shall be calculated as follows:

$$IR [\%] = WGV [\%] \times (-2) + 240$$

5. The **Withdrawal Curve** shows the **Withdrawal Rates** as a function of the **Storage Customer's Working Gas Volume** which it shall be entitled to use.



The available **Withdrawal Rates** of the **Storage Customer** (WR) in case a **Customer's Storage Level of Working Gas Volume** (WGV) falls below 30% shall be calculated as follows:

$$WR [\%] = WGV [\%] \times 1.3333 + 60$$

#### Article 14 Delivery Points

1. The **Point of Injection** and the **Point of Withdrawal** of the **Storage Location** correspond to the entry-/exitpoint "USP Haidach" of the **Neighbouring Natural Gas Network** operated by Bayernets GmbH, Munich (Netpoint-ID entry: BAY-700069-8021-1, Netpoint-ID exit: BAY-700069-8021-2).
2. To the best of its ability astora may provide an additional **Point of Injection** and **Point of Withdrawal** of the **Storage Location** corresponding to an entry-/exit point that has yet to be published of the then **Neighbouring Natural Gas Network** operated by Open Grid Europe, Essen. This **Point of Injection** and the **Point of Withdrawal** is to be completed based on the current planning status by 01.01.2019 and is expected to be available from this point of time for the booking at the then Neighbouring Natural Gas Network of Open Grid Europe. astora endeavours to inform customers duly about the progress and commissioning of this **Point of Injection** and the **Point of Withdrawal** as soon as astora has detailed and certain knowledge of the schedule of the commissioning available. As soon as the additional Point of Injection and Point of Withdrawal is available for booking at Open Grid Europe, this point can be used in an entirely flexible manner as an alternative to "USP Haidach", and nominations can take place for both points as needed.
3. The **Allocation Procedure** in Haidach shall be declaratory.

## **Article 15 Natural Gas Quality Specifications**

For the Haidach **Storage Facility** at the **Delivery Points** listed in Article 7 hereunder the values of DVGW G 260; 2nd gas family shall apply with the exception of the following parameters:

Carbon dioxide (CO<sub>2</sub>) ≤ 2 mol%

## **Article 16 Changes in the Storage Specification**

1. **astora** may change this **Storage Specification** – except for Article 3, Article 4 and Article 5 - at any time. Deviating from Sentence 1 **astora** shall be entitled to change Article 3, Article 4 and Article 5 at any time as far as these changes are economically neutral updates or amendments without any impact on existing **Storage Services**.
2. With regard to changes in the **Storage Specification** Article 44 of the **General Terms and Conditions for Storage Access** shall apply accordingly.