

THE GLOBAL LPG PARTNERSHIP

# EXECUTIVE SUMMARY of The LPG MASTER PLAN FOR CAMEROON

- FINAL VERSION -

Presented at the LPG AD HOC COMMITTEE  
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## 1. Introduction and review of objectives governing the MOU signed with MINEE

In its aspiration to become an emerging nation by 2035, the government of Cameroon intends to extend the availability, access and use of liquefied petroleum gas (LPG), made up of butane and/or propane, for cooking and other uses to approximately 57.8% of the population on an economically sustainable basis, in compliance with stated goals of increasing access to clean energy resources, improving public health, reducing deforestation and the adverse effects of climate change caused by deforestation, while increasing economic development.

The mission assigned to The Global LPG Partnership (GLPGP) is responsibility for conducting and financing aspects relating to project planning:

- Develop and prepare the LPG Master Plan in Cameroon (Master Plan) in cooperation with the government and in consultation with all stakeholders;
- Put in place the process to draft the Master Plan for Cameroon (the GLPGP Process) which will consist of:
  - \* Evaluating the regulatory framework, discussing among all stakeholders with input from shared and past experiences relating to the regulatory framework and transition programs based on similar country projects elsewhere in the world that have been successful or failed geared at reaching a consensus on how best to proceed with necessary improvements of existing regulations in the areas of LPG sales, financing and the sustainable implementation of the Master Plan;
  - \* Defining and sizing investments and necessary interventions along the LPG value chain from a consensus on the Master Plan;
- Prepare terms of reference with the government of a Master Plan based on GLPGP country standards;
- Align the Master Plan with established cooking policies developed by GLPGP partners such as the World Bank, the Global Alliance for Clean Cookstoves and the SE4ALL initiative of the United Nations, focusing especially on the “White Paper on Energy” of the Economic Community of Central African States (CEEAC) and that of the Central African Economic and Monetary Community (CEMAC) on 7 October 2014 in Yaoundé; and
- Take final investment decisions on projects and/or investments to be financed by or through GLPGP, at its discretion, but in compliance with the final investment and/or arrangements for interventions.

At the request of the government of Cameroon, the Master Plan for 2015-2030 was developed and assigned to GLPGP through a Memorandum of Understanding (MOU) which clearly states the project's objectives, and signed on 11 December 2014. Subsequently, an AD HOC Committee responsible for monitoring and supporting the initiatives of GLPGP in Cameroon was put in place as per memo N° 001379/2015/MINEE/SG of 15 April 2015 which clearly defines the role of this committee made up of 17 members including two representatives from GLPGP. The GLPGP Process was presented and approved during the 3<sup>rd</sup> AD HOC Committee meeting on 8 September 2015. Subsequently, the Minister of Water and Energy authorized GLPGP to unfold its technique and process to the private sector through memo N° 03937/2015/MINEE/CSAGLPGP of 2 November 2015.

The present document is the Executive Summary of the Master Plan dated 15 August 2016.

## 2. Main conclusions on actions to be carried out

The GLPGP Process with the private and public sector, compared with the characteristics of developed LPG markets, reveals a weakness in the offer of LPG cylinders and the distribution network geared at resupplying filled cylinders when empty. The growth in the number of cylinders in circulation in Cameroon barely increased faster than the population. If such a trend continues, considering the expected growth of the population, it would take over 50 years to achieve the government's objectives. Looking at the breakdown by region, Douala and Yaoundé regions accounted for nearly 87-88% of consumption over the last 15 years. The other regions represent about 13% of consumption and grow at the same rate, thereby demonstrating the ability of stakeholders to develop use of LPG, despite the difficulties involved. The LPG offer equally includes logistics capacity (filling plant and bulk LPG transportation) which has reached saturation in some places (Douala and Yaoundé) but less so in areas lacking cylinders and a network of sales outlets with reliable distributors.

Actions to be carried out, of which the private sector is well aware through data collected by GLPGP, consist in increasing the cylinder investment rate to approximately 400,000 cylinders per year, and quickly growing the number of sales outlets from the current 4,766 to more than 11,000 (with a minimum ratio of 3,000 inhabitants per outlet), to be supplied by Distributors under the control of the Marketers, in an effort to ensure that they will not lose their cylinders.

As such, the accepted market indicator of kg/person/year should rise from 4 currently to between 12 and 15, or even 20, which is the level of most of the developed LPG markets.

The 2.275 million of 12.5 kg-equivalent cylinders currently in circulation, representing a ratio of 9.6 persons per cylinder, should increase to approximately 9 million.

The number of Distributors is insufficient and beyond the Marketer's control; only 35 are exclusive and 285 non-exclusive (referred to as wholesalers) and have no obligation vis-à-vis cylinder investors, which does not allow the control of the development by the Marketer.

In conclusion, an effective policy should lead to:

- An increase in the number of cylinders in circulation to 1 cylinder for every 4 persons
- An increase in the number of sales outlets toward at least 3,000 persons per sales outlet
- An increase in the number of Distributors for at least 1,000T/year for all Distributors.
- Stakeholders in the distribution process (wholesalers/sales outlets) should be under the control of Marketers
- An LPG logistics chain with sufficient filling, storage and transportation capacities to ensure there is no shortage of filled and leak-free LPG cylinders while maintaining profitability of investment.

## 3. Main projection tables 2015-2030

To achieve the objectives of the Master Plan, the availability of cylinders, number of sales outlets and organization of resupply capacity should be increased as follows:

Cylinders in circulation must increase from 2.2 million in 2015 to 9.1 million in 2030, thus leading to an investment of 6.8 million of 12.5 kg-equivalent cylinders.

	2015	2020	2025	2030
Evolution of circulating cylinders in thousands	2 275	4 273	6 513	9 091

The geographical distribution of cylinders in circulation will be done to benefit all regions so as to gradually reflect the expected distribution of the population by 2030 as shown below.

Geographical distribution of cylinders in circulation in %	2015	2020	2025	2030
FAR NORTH (Maroua)	3%	5,2%	7,2%	9,3%
NORTH (Garoua)	2%	3%	4%	6%
ADAMAWA	4%	4%	4%	4%
CENTRE (Yaounde)	34%	30%	26%	22%
SOUTH (Kribi)	2%	3%	3%	3%
EAST (Bertoua)	1%	2%	3%	4%
LITTORAL (Douala)	43%	38%	33%	27%
SOUTH WEST (Kumba)	3%	5%	6%	8%
NORTH WEST (Bamenda)	3%	5%	7%	9%
WEST (Bafoussam)	5%	6%	7%	9%
CAMEROON	100%	100%	100%	100%

The number of sales outlets shall increase from 4,766 in 2015 to 11,350 by 2030 to reach a ratio of 2,721 persons per sales outlet.

During the same period, the number of Distributors shall increase from 320 to 515. Distributors will have the important task of opening up many sales outlets and supplying them with filled cylinders. (In line with the private sector, wholesalers should be converted to brand-exclusive Distributors.)

Filling capacities will increase from 96kT/year in 2015 to 373kT/year by 2030, thereby requiring an increase in filling capacity of 277kT/year over the period. A regional analysis justifies each region having a filling facility when its number of cylinders in circulation generates enough volumes to meet the filling plant's investment threshold.

kT/year of filling capacity	2015	2020	2025	2030
FAR NORTH (Maroua)	4	12	23	36
NORTH (Garoua)	0	7	14	22
ADAMAWA (Ngaoundere)	6	8	11	14
CENTRE (Yaounde)	18	57	71	80
SOUTH (Kribi)	0	7	10	13
EAST (Bertoua)	6	6	10	13
LITTORAL (Douala)	44	76	96	96
SOUTH WEST (Kumba)	8	11	22	31
NORTH WEST (Bamenda)	2	11	24	34
WEST (Bafoussam)	8	14	25	34
<b>Projected FILLING CAPACITIES (kT/year)</b>	<b>96</b>	<b>209</b>	<b>306</b>	<b>373</b>

LPG storage capacity (commercial butane) both at the import terminals and filling plants shall increase from 3,591 tons in 2015 to 20,056 tons by 2030, an increase of 16,465 tons, aiming at maintaining steady supply without temporary shortages and at low cost.

The Master Plan includes the installation of the Kribi import capacity in two phases and aboveground. (The underground storage mode might be a good alternative.)

The increase of storage capacities of filling plants shall be 2,857 tons.

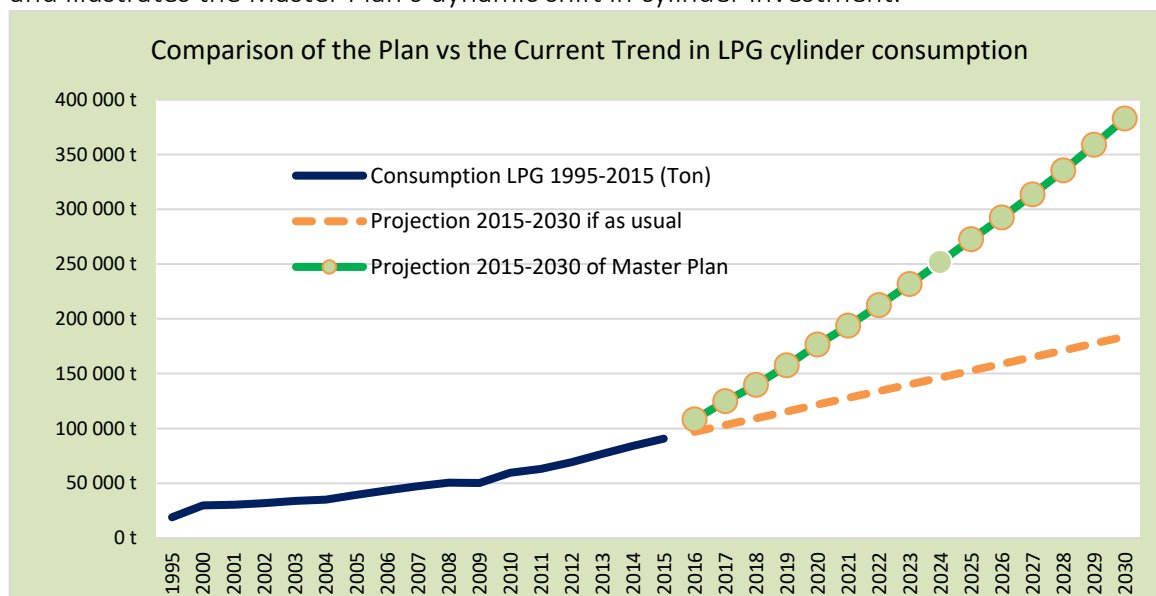
The table below shows the geographical distribution of storage capacities.

LPG storage capacities in ton	2015	2020	2025	2030
FAR NORTH (Maroua)	105	180	345	540
NORTH (Garoua)	0	105	210	330
ADAMAWA (Ngaoundere)	95	120	165	210
CENTRE (Yaounde)	561	855	1 065	1 200
SOUTH (Kribi)	0	7 500	13 500	13 500
EAST (Bertoua)	120	120	150	195
LITTORAL (Douala)	2 596	2 596	2 596	2 596
SOUTH WEST (Kumba)	40	165	330	465
NORTH WEST (Bamenda)	12	165	360	510
WEST (Bafoussam)	170	210	375	510
<b>LPG STORAGE CAPACITIES (Ton)</b>	<b>3 699</b>	<b>12 016</b>	<b>19 096</b>	<b>20 056</b>

As a result, LPG cylinder volumes will increase from 90kT in 2015 to 382 kT by 2030 with the following geographical distribution:

LPG consumptions in kT/year	2015	2020	2025	2030
FAR NORTH (Maroua)	2,1	9	20	35
NORTH (Garoua)	1,4	6	12	21
ADAMAWA	2,6	7	10	14
CENTRE (Yaounde)	32,5	53	71	84
SUD (Kribi)	1,9	5	8	13
EAST (Bertoua)	1,3	4	8	14
LITTORAL (Douala)	39,9	67	89	104
SOUTH WEST (Kumba)	2,1	8	17	30
NORTH WEST (Bamenda)	2,4	8	18	33
WEST (Bafoussam)	4,4	11	20	34
<b>LPG Volumes projected in KT</b>	<b>90,6</b>	<b>176,3</b>	<b>272,6</b>	<b>382,8</b>
<i>KPI : projection Kg/person/year</i>	<i>4,1</i>	<i>7,2</i>	<i>9,9</i>	<i>12,4</i>

The graph below shows the comparison of the Master Plan with the current investment trend and illustrates the Master Plan's dynamic shift in cylinder investment.



#### 4. Summary of investments 2015-2030

The cumulative investment is estimated at 403 million Euros, approximately 265 billion CFA F. This LPG investment cost per capita is 13 Euros, approximately 8600 CFA F, which is low compared to electricity or natural gas.

Cylinder investment, representing the addition of almost 7 million 12.5 kg equivalent<sup>1</sup> cylinders, is 243 million Euros, approximately 160 billion CFA F.

The funds needed after deducting the consignor's debt are 53 million Euros, approximately 34.7 billion CFA F. With an EBITDA<sup>2</sup> of the entire LPG private sector in Cameroon estimated at 5 million Euros (in 2015), it will be necessary to secure funding to support the needed pace of investment over the first five years at least.

**The funding must be studied as soon as this Master Plan is approved for implementation. GLPGP is capable of putting in place this funding with stakeholders concerned.**

Investment in LPG infrastructure (filling plants, supply terminals and bulk primary transportation) is approximately 160 million Euros, about 104.5 billion CFA F.

This estimation must be improved upon implementation of the Plan by appropriate technical studies. It does not include the investment for land acquisitions or concessions or taxes related to the approvals.

Investments in logistics	M€
Additional filling (277kT/year) and storage capacity (for 2870 T of butane) of filling plants	85,9
Cylinder Re-testing, certification and painting in filling plants	2,4
Additional capacity of the Kribi import terminal for 13,500 T of butane	54,0
Additional tank trucks for bulk transportation : 75 units	17,5
<b>Overall investments in logistics in million €</b>	<b>159,8</b>

At this stage, prior to the approval of the Master Plan, we did not include investment in the distribution network of Distributor and sales outlets: trucks of Distributors, cylinder racks for sales outlets, and additional circulating cylinder inventory. We believe this investment is less than 5% of the total amount. However, this estimate can be made when patterns of the distribution channels are approved (which requires knowing the maximum cylinder inventory per sales outlet).

The financing of such projects will be studied as soon the Master Plan is approved by the Public Authorities.

<sup>1</sup> For calculation consistency, all cylinders of different sizes are counted at their 12,5 kg cylinder equivalent: for example 2,083 cylinders of 6kg are counted as 1 cylinder of 12,5 kg.

<sup>2</sup> EBITDA (for Earnings before Interest, Taxes, Depreciation and Amortization) is the criteria commonly used by the private sector to calculate the financial performance of a business.

## 5. Recommendations for improvements in the Master Plan

Recommendations listed below are drawn from the Master Plan dated 15 August 2016, in which all explanations and attached logic are detailed.

### 5.1. Reviewing the LPG legal framework

The goal is to fully and accurately define the LPG Distribution Model used in Cameroon, which is the same Model used in all developed LPG markets.

This Model both enables and encourages:

- Cylinder investment, implying the cylinder ownership for the Marketer, ensuring him not to lose any cylinder: no unregulated or illegal filling or cylinder “theft” by any competitor.
- Cylinder availability to users through a dense network of sales outlets: 5 minutes’ walk (the marketer’s brand distribution network)
- Constant supply of LPG due to the predictability of its distribution network.
- Cylinder safety as per the system of “an empty cylinder for a filled one” and cylinders checked by dedicated, competent staff in approved filling plants.

The main recommendations for amending the regulatory framework are:

#### Regarding cylinders

- The ownership of cylinders for the Marketer is already written in the regulatory framework, which secures the investment and facilitates the work of judges in case of conflict regarding cylinder ownership.
- Already regulated: the registering, through issuance of a certificate by the competent authorities, of the brand and color of cylinders belonging to the Marketers.
- Complete review of approval instructions in view of allowing MINEE to follow up the growth of the number of cylinders in circulation, which is the central point of the development of LPG, related to empty and refilled cylinder importation and exportation, aiming at clarifying the control by the customs.
- Already regulated: the periods for cylinder re-testing is confirmed at 10 years, and when possible in Cameroon a recertification by heat process, in order to extend the life of the cylinder beyond the existing limit of 25 years, which will help reduce the investment in cylinders.
- Clarify conditions for disposing of defective or faulty cylinders: criteria, approval and registration procedures of discarded or scrapped cylinders

#### Regarding the rights and obligations of Marketers

- Increase to 30,000 the minimum number of cylinders a Marketer must acquire to get the license.
- The prohibition to get a supply of LPG for filling purposes without a Marketer’s license is already regulated.

#### Regarding retail outlets

- Create sales outlet status by modifying the status of gas storage facility (“Dépôt Gaz” in the Cameroonian regulation) in an effort to increase the number of sales outlets with limited cylinder storage for safety reasons
- Already regulated in 2016: each retail outlet must show an identification board, showing the retail outlet license and the brands contracted
- Already regulated in 2016: registering the retail outlets with the MINEE.

Regarding Distributors: the following points will have to follow the natural evolution of competition, the tremendous pace of cylinders’ investment, and are not included at this



stage. It is the responsibility of the Marketer to gradually switch to exclusive distributorship or to remain with nonexclusive distributorship, for the benefit of his growth.

- Define the status of exclusive Distributor, with rights and obligations (agreement with the Marketer, cylinder storage facility, trucks and driver training)
- Convert the status of wholesaler to exclusive Distributor with freedom of choice for the wholesaler
- Obligate the Distributor to have an authorized cylinder storage facility with an inventory of circulating cylinders and pallets while complying with safety measures. The request for authorization must be done via the Marketer.
- Prohibit a Distributor from transporting cylinders without an exclusive distributorship agreement and those belonging to another competitor.
- Register with MINEE the tags of the cylinder delivery trucks including the trucks under the responsibility of the Marketers.

Regarding filling related operations

- Filling: the current procedure for approving the construction of new filling plants is already in place, via the Commission of Petroleum Products, which ensures the potential of invested cylinders prior to approval of any new filling plant project.
- Already in the regulations: prohibit the filling of cylinders belonging to another competitor without his prior consent.
- Already in the regulations: prohibit micro-filling of cylinders in places open to public, dubbed “skid,” without exchange of an empty cylinder for a filled one.

#### 5.2. Strengthening SCDP’s role in national LPG filling operations.

- Taking into account the important role of SCDP in the cylinders’ filling, and the desired improvement of productivity, SCDP should study the possibility of an internal organization entirely dedicated to LPG, to make the management of LPG more focused on filling operations, on monitoring the supply by road and by railway and by the LPG inventory, and on monitoring the training of operators in filling plants. Including the operation policy with working inventory of palletized cylinders, allocated by the Marketers would allow for re-testing, speeding up cylinder supply to sales outlets, and avoiding shortages.

- Pursuing the project of creation of an importation terminal at Kribi so as to decongest the Bonaberi terminal, reduce the import cost by larger imported lots, reduce the risk of the country’s breakdown in supply and support the expected LPG production extracted from gas fields and their export.

#### 5.3. LPG pricing structure

Review the LPG pricing structure to suit the changing dynamics of the distribution Model (filling price, Marketer price, Distributor price, retail outlet price, user price). One objective is to simplify the selling price to the user and billing for Distributors and retail outlets, by setting a uniform sale price for any filling plant and a uniform distributor price, through the reviewed transportation equalization.

A detailed proposal of reviewed price structure could be drafted by GLPGP, as in the Master Plan.

#### 5.4. Taxes

Reduce taxes on cylinder importation, accessories and gas cookers to the minimum possible. A rate of 1% during the first 10 years could be a reasonable proposal.

## 6. LPG regulatory entity at state level

Put in place a regulatory entity geared at coordinating inter-ministerial follow-up on LPG activities. This entity will act like an interface between the various Ministries on aspects relating to standards, safety standards, safety audits, prices and pricing structure, authorizations to import and export cylinders, Distributors' licenses, registration of sales outlets, registration of cylinder brands and colors as well as the country's supply of LPG and transport safety certification. This list can be enriched.

The entity also will act like an interface with the private sector and representative associations and, where applicable, examine all issues regarding the LPG distribution sector.

Set up a website through the regulatory entity where data relating to the LPG business (LPG pricing, legal instruments, authorized distributors, sales outlets etc.) is accessible by the public, with the possibility of registering aspects relating to shortages or abuse.

## 7. For the Consumers

Implement LPG promotional campaigns demonstrating the benefits of LPG use in households and explaining the ease of use and safety rules. An ad hoc working group will be set to work on it.

Coordinate with Marketers the establishment of cylinder sales plans in areas with a flawed distribution structure. These plans should include training components on how to use LPG and the related safety rules.

Develop microfinance offers to facilitate consumer acquisition of cylinders and LPG cookers.

## 8. Expected benefits of replacing combustion with wood with combustion with LPG

These are estimates of gas emission reduction impacting on the climate and the health of the population.

Estimate on the reduction of CO<sub>2</sub> emission by replacing combustion with wood to LPG: the calculation is made before deciding whether CO<sub>2</sub> is of fossil origin or not. This is simply to compare two modes of emission. The calculation uses the LPG<sup>3</sup> emission factors: 260 g/kwh (life cycle value). In the absence of an emission factor for wood in Africa, we have used the estimated factor for wood<sup>4</sup> in Europe of 355g/kwh.

In 2015, LPG consumption for cooking would save 1 million tons of CO<sub>2</sub> and 0.92 million tons of wood. By 2030, LPG consumption per this Master Plan will have saved 4.5 million tons of CO<sub>2</sub> and 3.9 million tons of wood.

A more comprehensive calculation will help improve the accuracy of the calculation, particularly by clearly defining the emission factor of wood used in Cameroon.

Estimate of the reduction of pollutants from combustion with wood:

Pollutants emitted<sup>5</sup> which are frequently studied: SO<sub>2</sub> – NO<sub>x</sub> – CO – COVNM (non-methane volatile compounds) – HAP<sup>6</sup> – PM<sub>10</sub> – PM 2.5 and PM<sub>1.0</sub>. This calculation will be completed when the

<sup>3</sup> For the GPL : CFBP - RT2012 du 29 avril 2009, <http://www.cfbp.fr/proprietes-des-gpl/emissions-de-co-small-sub-2-sub-small-n315>  
Calculé par l'ADEME et Base Carbone® - Base Carbone de l'ADEME, en ligne depuis le 29-03-2012 ([www.basecarbone.fr](http://www.basecarbone.fr))

<sup>4</sup> <http://www.economiedenergie.fr/les-%C3%A9missions-de-co2-par-%C3%A9nergie.html>

<sup>5</sup> The reference document is : [https://www.ofme.org/bois-energie/documents/Environnement/etude\\_ademe\\_emission\\_atmo6\\_07\\_2007.pdf](https://www.ofme.org/bois-energie/documents/Environnement/etude_ademe_emission_atmo6_07_2007.pdf)

<sup>6</sup> The 4 HAP retained by the UE are: benzo(a)pyrène, benzo(b)fluoranthène, benzo(k)fluoranthène and indeno(1,2,3,-cd) pyrène

assumptions of wood used in Cameroon are known.

Estimate of the number of trees saved:

This calculation will also be completed when the assumptions of wood used in Cameroon are known. For information purpose, in Indonesia<sup>7</sup>, wood conversion to LPG from 1.1 million tons to 5.4 million tons led to the saving of 46.6 million trees.

The saving of carbon sequestration due to the saving of forests will be calculated in coordination with MINEE.

Estimate of the number of jobs created: more than 18,000 jobs.

This calculation will be updated when the Master Plan is completed.

## 9. Summary of the stages to put in place the GLPGP process

Seven AD HOC Committee meetings were held between 27 July 2015 and 7 April 2016. The GLPGP Process was presented and approved at the meeting held on 8 September 2015 during the training on the TOR of the Master Plan, namely:

- The establishment of a National Investment Plan from those of each private sector stakeholder confidentially collected in order not to create competition
- The Roadmap of desirable changes expressed and studied in public sector commissions from items collected through the questionnaire completed by the private sector

The process described the public and private sectors contribution formula.

- 4 October 2015: Setting up of commissions by the Private Sector Working Group during meeting N°4.
- 2 November 2015: Authorization granted to GLPGP by MINEE to unfold the process to the private sector.
- 29 January 2016 : Forwarding of the questionnaire to Marketers
- 8 March 2016 : Presentation of first reports of work of the public sector commission in October 2015
- 9 July 2016 : Receipt of the last questionnaire filled out by Marketers

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<sup>7</sup> Pertamina : The challenges of Infrastructures and Distribution of the Kerosene to LPG Conversion Program in Indonesia

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