

# Pacific Biomedical Network Meeting

## WHO Regional Oxygen Scale-up Initiative

# Medicinal Oxygen (Oxygenium Medicinalis)

- **Oxygen 93%**

- **Definition.** Oxygen 93% contains not less than 90.0% and not more than 96.0% (v/v) of O<sub>2</sub>, the remainder mainly consisting of argon and nitrogen.
- **Production.** Oxygen 93% is produced from ambient air by pressure swing adsorption (PSA) or vacuum swing adsorption (VSA). During production, the oxygen content is continuously monitored. The production method is validated to demonstrate that Oxygen 93% complies with the following limits: carbon dioxide: maximum 300 ppm (v/v); carbon monoxide: maximum 5 ppm (v/v); nitrogen monoxide and nitrogen dioxide: maximum 2 ppm (v/v) in total; sulfur dioxide: maximum 1 ppm (v/v); oil: maximum 0.1 mg/m<sup>3</sup>; water: maximum 67 ppm (v/v) and that viable and non-viable particulates are eliminated or minimized and adequately controlled in the product.
- **Identity test.** Carry out the test as described under "Assay". The sample gas complies with the limit. The paramagnetic signal exhibited confirms the presence of oxygen.
- **Carbon monoxide.** Determine the content using a carbon monoxide detector tube according to the manufacturer's instruction. Pass the required volume of the test gas through the tube and read the value corresponding to the length of the coloured layer or the intensity of the colour on the graduated scale; not more than 5 ppm (v/v).
- **Carbon dioxide.** Determine the content using a carbon dioxide detector tube according to the manufacturer's instruction. Pass the required volume of the test gas through the tube and read the value corresponding to the length of the coloured layer or the intensity of the colour on the graduated scale; not more than 300 ppm (v/v).
- **Water.** Determine the content using a water vapour detector tube according to the manufacturer's instruction; not more than 67 ppm (v/v).
- **Assay.** Determine the percentage content of Oxygen (O<sub>2</sub>) using a paramagnetic analyser which electronically measures the molecule's interaction with magnetic fields.
- **Impurities**
  - A. CO<sub>2</sub>, carbon dioxide.
  - B. CO, carbon monoxide.
  - C. Water.

## **Resolution on Increasing access to medical oxygen**

Member States endorsed a resolution recognizing the critical role of medical oxygen for treating hypoxemia (blood oxygen deficiency) across many diseases, including pneumonia and tuberculosis, particularly for older populations and other vulnerable groups, and for surgery and trauma.

In developing countries many health facilities lack uninterrupted access to medical oxygen, resulting in preventable deaths – a problem that has been exacerbated by the COVID-19 pandemic, when the need for medical oxygen has exceeded the capacities of many health systems.

This resolution recognizes that medical oxygen generation and distribution requires a specialized infrastructure. It also underscores the need for its delivery to be safely and accurately executed using good quality medical devices through an interdisciplinary health workforce, including engineers.

The new resolution urges Member States to set up, as appropriate, national and subnational medical oxygen systems to secure the uninterrupted provision of medical oxygen to healthcare facilities at all levels including rural and urban set-ups.

It underlines WHO's role in supporting Member States through developing guidelines, technical specifications, forecasting tools, training materials, and other resources, and by providing technical support specially designed to improve access to medical oxygen to meet the needs of health systems in developing countries.

# What's in the Box?







# Filling Station





200 J-size cylinders  
(50L)  
WP: 200 Bar  
TP: 300 Bar

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# OXYBABY Professional O2 Analyzer







Spare Parts  
Covering  
3 years  
operation



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**Commissioning  
3 - 4 days**

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# Operator Training

## 2 - 3 days

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Cambodia,  
Cenat  
Capacity: 69m<sup>3</sup>  
Filling station



Lao PDR,  
Savanakhet  
Capacity: 21m<sup>3</sup>  
Filling station

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# Air freight EU -> Fiji

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Sea Freight

Fiji ->

- Cook Islands
- Vanuatu
- Solomon

Tonga  
Vaiola Hospital  
Capacity: 21m<sup>3</sup>  
Filling Station

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Vanuatu  
VCH  
Capacity: 21m<sup>3</sup>

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Solomon Islands  
NRH  
Capacity 21m3  
Filling Station

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BMET

Refresher Training

- Oxygen concentrator
- Ventilator
- Patient Monitor

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- Autoclave
- etc



# WESTERN PACIFIC REGION: MEDICINAL OXYGEN SCALE-UP INITIATIVE PROGRESS

- Country ▾
- Health Facility ▾
- Status ▾



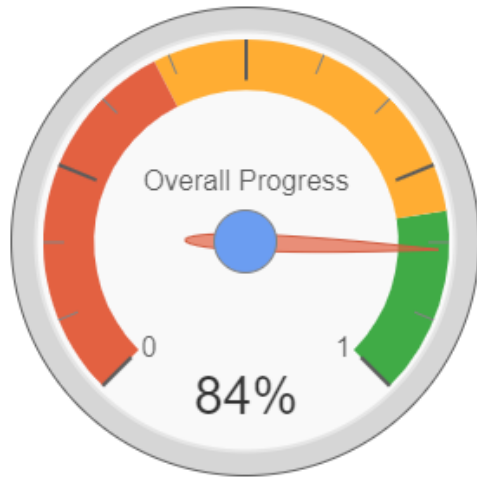
Total Investment (USD)  
**8.4M**



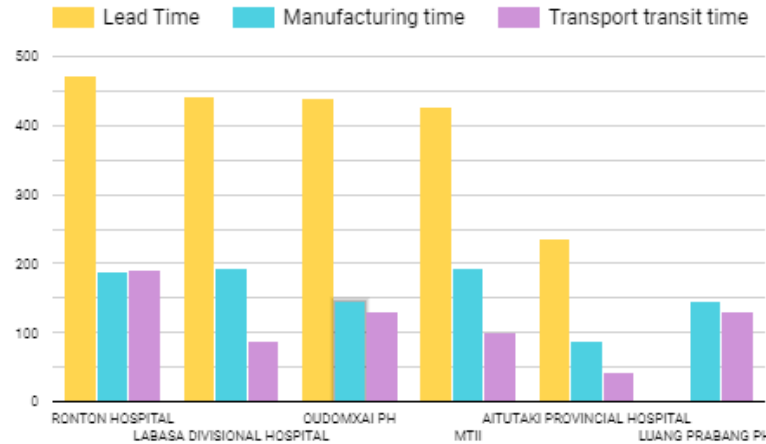
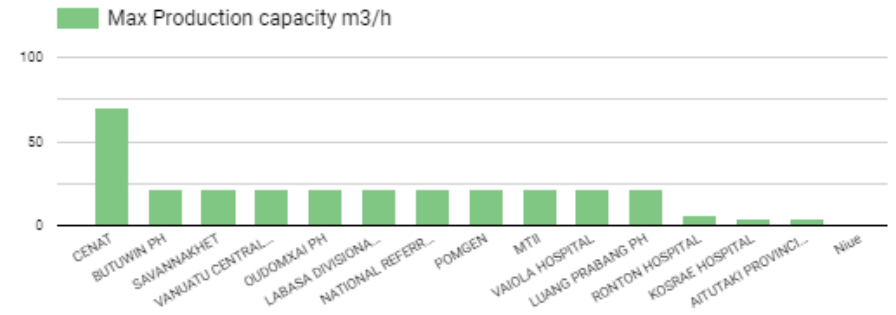
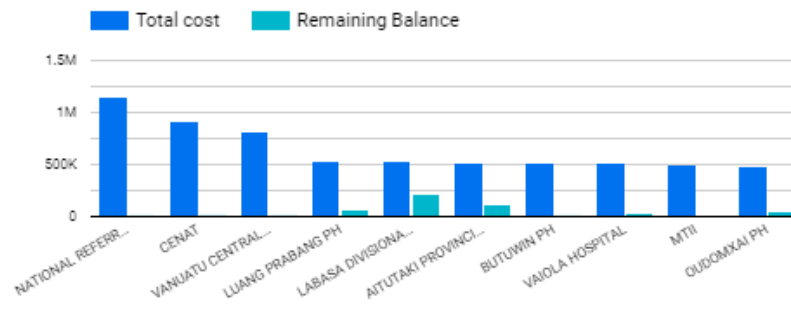
Health Facilities  
**15**



Max Cylinders/24h, (J-Size)  
**851**



Country	Health Facility	Overall Progress	Status	Cylinders/24h (J-Size)
Cambodia	CENAT	96.92%	Operating	74
Cook Islands	AITUTAKI PROVINCIAL HOSPITAL	79.27%	Delivered	12
Fiji	LABASA DIVISIONAL HOSPITAL	84.70%	Delivered	74
Kiribati	RONTON HOSPITAL	88.68%	Delivered	12
Lao PDR	OUDOMXAI PH	92.91%	Delivered	74





# Further important actions for consideration

- a. Work with the relevant authorities to adopt and implement standards and regulations governing medicinal oxygen while promoting third-party quality assurance.
- b. Support the development of sustainable energy solutions, including the use of renewable energy sources, for the PSA oxygen system
- c. Continued capacity building & training of biomedical technicians and engineers.
- d. Implementation of cost-efficient PSA oxygen plant operations.
- e. Creation of a regional platform for knowledge sharing and capacity building.

## Reference:

1. Oxygen sources and distribution for COVID-19 treatment centres, WHO Interim guidance, 4 April 2020 <https://www.who.int/publications/i/item/oxygen-sources-and-distribution-for-covid-19-treatment-centres>
2. WHO- UNICEF Technical Specifications and Guidance for oxygen therapy devices, 2019 <https://apps.who.int/iris/handle/10665/329874>
3. Oxygen Generation and Storage July 2021 PATH | CLINTON HEALTH ACCESS INITIATIVE [https://media.path.org/documents/O2\\_generation\\_and\\_storage\\_report\\_V8\\_Jun2021.pdf?\\_gl=1\\*15lr8nm\\*\\_ga\\*MTg5OTk1NzI5Mi4xNjYxMDY4Mjk5\\*\\_ga\\_YBSE7ZKDOM\\*MTY2MTA4NzY1MS4yLjEuMTY2MTA4NzY4OS4wLjAuMA](https://media.path.org/documents/O2_generation_and_storage_report_V8_Jun2021.pdf?_gl=1*15lr8nm*_ga*MTg5OTk1NzI5Mi4xNjYxMDY4Mjk5*_ga_YBSE7ZKDOM*MTY2MTA4NzY1MS4yLjEuMTY2MTA4NzY4OS4wLjAuMA)
4. WPRO Dashboard for medicinal oxygen scale-up in Western Pacific Region as of 22 August 2022 [https://datastudio.google.com/u/0/reporting/9e6818e7-d2aa-43b6-9dd9-81bc898e1616/page/p\\_2e9hzw9mwc](https://datastudio.google.com/u/0/reporting/9e6818e7-d2aa-43b6-9dd9-81bc898e1616/page/p_2e9hzw9mwc)
5. WHO technical consultation on oxygen access scale-up for COVID-19 2021 <https://apps.who.int/iris/handle/10665/342817>
6. Priority medical devices list for COVID-19 response and associated technical specifications, WHO Interim guidance, 19 November 2020 <https://apps.who.int/iris/handle/10665/336745>

## Other WHO publications and resources:

1. Medical devices-training videos on life cycle of equipment: [https://www.who.int/health-topics/medical-devices#tab=tab\\_1](https://www.who.int/health-topics/medical-devices#tab=tab_1)
2. Health care Readiness: <https://www.who.int/teams/health-care-readiness-clinical-unit/covid-19ck>
3. WHO Respiratory Support Research: <https://www.who.int/news-room/articles-detail/who-respiratory-support-research-group>
4. Clinical care of severe acute respiratory infections-Tool kit: <https://www.who.int/publications/i/item/clinical-care-of-severe-acute-respiratory-infections-tool-kit>
5. COVID-19 Clinical Care Pathway: <https://www.who.int/tools/covid-19-clinical-care-pathway>
6. Health product policy and standards: <https://www.who.int/teams/health-product-and-policy-standards/standards-and-specifications/pharmaceuticals/working-documents-public-consultation>
7. [Oxygen - Global \(who.int\)](https://www.who.int/health-topics/oxygen#tab=tab_1) [https://www.who.int/health-topics/oxygen#tab=tab\\_1](https://www.who.int/health-topics/oxygen#tab=tab_1)
8. [Oxygen Access Scale Up \(who.int\)](https://www.who.int/initiatives/oxygen-access-scale-up) <https://www.who.int/initiatives/oxygen-access-scale-up>
9. [Monograph: Medicinal Oxygen](https://digicollections.net/phint/2022/index.html#d/b.6.1.225): <https://digicollections.net/phint/2022/index.html#d/b.6.1.225>