



Building a Skilled and Certified Biogas Workforce

A Policy Brief on the Co-Design and Gazettement of Kenya's National Biogas Training Curriculum

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The African Biogas Component (ABC) in Kenya (2022-2026) aims at facilitating a shift of the biogas market from its pioneering to the expansion phase with a focus on the installation of over 10,000 small-scale (0 to 23m³) and 100 medium scale (24 to 500m³) biogas plants. This will be achieved by means of a well-balanced mix of demand-side, supply side, financing and enabling environment interventions, geared at boosting demand and supporting small-scale and medium scale biogas companies in acquiring more clients.

The project is implemented by a consortium led by GIZ and SNV (the Netherlands Development Organization) in cooperation with Africa Bioenergy Programs Limited (ABPL - ex-Kenya Biogas Program)

KEY MESSAGES

- **A comprehensive biogas training curriculum has been developed and successfully piloted**, demonstrating 96% trainee pass rates and immediate practical application through the construction of functional training facilities in NITA Nairobi, yet it awaits official gazette to enable nationwide implementation.
- **Kenya's biogas sector faces a critical skills gap** that threatens to stall market expansion despite significant international investment and alignment with national clean cooking targets of reaching 3% household biogas adoption by 2028.
- **Gazette of the curriculum will establish a standardized certification framework** that enables consumer confidence, professional recognition for technicians, and creates a foundation for sustainable market growth while addressing the aging workforce challenge. (GIZ, 2024)
- **Close collaboration among all relevant stakeholders** including private sector, the Government, and development partners will accelerate curriculum implementation.



Programme launch attended by multi-sectoral stakeholders and the then Cabinet Secretary, Ministry of Energy and Petroleum, Dr. Monica Juma.

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POLICY LANDSCAPE

Kenya's biogas sector stands at a critical juncture where market demand increasingly outpaces the availability of qualified, certified technicians.

Currently, there exists no formal certification system for biodigester construction professionals, leaving consumers unable to verify technician qualifications and creating no centralized registry for locating certified practitioners. While a comprehensive training curriculum (NITA, 2023)¹ has been developed in accordance with KS 2566 (2015) Standard

- **Design and Construction of Domestic Biogas Plants Code of Practice**

It has not yet been officially gazetted, preventing its formal implementation across training institutions nationwide.

This policy gap carries significant implications for market development and quality assurance.

The absence of recognized certification creates barriers to professionalization, limits workforce mobility, and undermines consumer confidence in biogas technology adoption. Moreover, the existing technician workforce is aging, with inadequate mechanisms to transfer knowledge to younger practitioners or recognize the substantial expertise that experienced masons have accumulated through years of practical work in the field.

The urgency of addressing this issue is underscored by multiple converging factors. Kenya's National Cooking Transition Strategy has set ambitious targets to increase biogas adoption to 3% of households by 2028, building on momentum from internationally funded initiatives including the African Biodigester Component (GIZ, 2024)². While the sector is expanding rapidly, due to the impossibility to certify qualified workforce this growth trajectory risks stalling as quality concerns and installation inconsistencies erode consumer trust and limit market penetration beyond early adopters (GIZ, 2024).

1. NITA, 2023. Biodigester Installation curriculum. Kenya: Ministry of Labour and Social Protection, National Industrial Training Authority Curriculum
2. GIZ, 2024. CPE ABC Kenya Executive Summary Draft. 3 Final. Kenya: GIZ



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KEY FINDINGS FROM ABC **PROGRAMME**

1. Structured Training is critical to success of functionality and uptake

The African Biodigester Component Programme has generated evidence supporting the effectiveness of structured biogas training initiatives (GIZ, 2024). The proposed curriculum has been piloted in two different instances by GIZ and African Bioenergy Program Limited (ABPL) and by GIZ and NITA respectively - demonstrating the curriculum's practical effectiveness. The ABPL training, piloted by GIZ across multiple regions, (ABPL;2024,2025)¹ trained 240 individuals in six different areas: Nyanza, Meru and Upper Eastern, Coastal Region, Western, Tana River-Kilifi-Lamu, and Machakos-Lower Eastern areas. This 7-8 days intensive training focused on MKD (fixed-dome) biodigester construction and included a follow-up programme with half-day workshops six months after the training to reinforce skills and address practical challenges encountered in the field. Notably, 65% of trainees remained actively working in the biogas sector six months after training completion, demonstrating strong retention and the programme's relevance to actual employment opportunities. However, only 22% of participants were women, highlighting the need for more targeted gender inclusion strategies in future iterations.

2. Curriculum is effective in content and application

The NITA pilot trained twenty-four individuals in a two-week intensive training session, with twenty-three successfully passing the final examination, a 96% pass rate that demonstrates both the curriculum's clarity and trainees' skill acquisition. The training assessment included a comprehensive grading system documented in the NITA pilot report, providing transparent evaluation criteria. Most significantly, participants constructed a functional biogas unit at the NITA training facility in Nairobi during the programme, creating a permanent demonstration and training resource while proving trainees' practical competence. This installation serves as tangible evidence that the curriculum successfully bridges theoretical knowledge and practical application.

3. Effective training increases client satisfaction

The ABC project's results further underline the need for qualified workforce. The ABC mid-term evaluation reports that farmers express remarkably high satisfaction with professionally installed biodigester systems, with many considering bio-slurry benefits for agricultural productivity to be the primary advantage of biogas adoption. However, quality concerns persist when installations are performed by uncertified practitioners, creating market uncertainty. The evaluation notes that word-of-mouth referrals among farmers represent one of the most powerful marketing methods for biogas technology, a dynamic that depends entirely on consistent, high-quality installations that function reliably over time.

4. Demonstrated capacity of private sector to train

Prior to formal curriculum development, various stakeholders attempted to create training materials independently, including initiatives by BioNet and individual companies. While these efforts demonstrated sector commitment to workforce development, the lack of standardization created low adherence to standards in training quality and certification recognition. The formal curriculum development process, aligned with KS 2566 (2015) standards, represents a consolidation of industry best practices and technical requirements into a coherent, nationally recognized framework.

5. Importance of integrating training initiatives into government structures and frameworks

Critical to a sustainable development of the sector, the ABC evaluation emphasizes the importance of integrating training initiatives into government structures and frameworks rather than maintaining them as externally funded parallel systems. The project's collaboration with NITA for curriculum pilot exemplifies this approach, creating pathways for institutional ownership beyond the project's September 2026 completion date.

POLICY RECOMMENDATIONS

1. Establish a Multi-Stakeholder Coalition for Implementation Support:

While the gazettelement of the proposed curriculum is time-critical, this should represent the foundation for further, more specialized curricula to be developed. For this, KEREA (Kenya Renewable Energy Association), Kenya Biogas Stakeholders Network (BioNet), and other industry associations should form a formal coalition with relevant ministries to champion curriculum implementation and ongoing development. This coalition should meet regularly to address implementation challenges, advocate for policy alignment, coordinate training delivery across institutions, and develop frameworks for advanced certification levels. The coalition should also establish working groups focused on specific issues such as gender inclusion in training programmes, quality assurance mechanisms, and integration of emerging biogas technologies into the curriculum. GIZ and other development partners can provide technical support and convening functions during the initial establishment phase, with a clear transition plan toward industry-led governance.

2. Gazette the National Biogas Training and Certification Curriculum:

The Ministry of Energy and Petroleum, in coordination with NITA and the Ministry of Labour and Industrialisation, should prioritize the formal gazettelement of the biogas training curriculum within the next three months. This action requires coordinated advocacy, validation workshops with key stakeholders, and strategic lobbying to ensure the curriculum receives the necessary regulatory approvals. The curriculum's gazettelement will establish the legal framework for nationwide curriculum implementation, enable formal recognition of certified technicians, and create the foundation for establishing a professional register of biogas practitioners. (GIZ,2022)¹

3. Incorporate Recognition of Prior Learning (RPL) Framework:

The curriculum implementation strategy must include explicit provisions for Recognition

of Prior Learning to address the substantial existing workforce of experienced biogas technicians who lack formal certification. Most practitioners possess years of practical expertise in biodigester construction and maintenance but were trained through informal apprenticeship, or company-specific or cooperation-partners (GTZ, Hivos / ABPL, SNV) programmes. An RPL pathway would allow these individuals to demonstrate their competencies through practical assessments and targeted gap training, receiving formal certification without requiring complete retraining. This approach respects existing skills, accelerates workforce formalization, and prevents the loss of valuable institutional knowledge as the aging technician population retires.

4. Simplify and localize curriculum language:

The Ministry of Energy and Petroleum with NITA stakeholders, should ensure that the national Biogas Training Certification Curriculum is simplified and translated into plain practitioner-friendly language, including Kiswahili and relevant dialects where appropriate. Key materials and assessments should use clear terminology, visual guides and step-by-step instructions aligned to on-site practice. This will lower barriers, support Recognition of Prior Learning (RPL), improve safety and assessment outcomes, and enable faster, more inclusive on-site uptake of the curriculum nationwide.

5. Create transparent access mechanisms:

Once gazetted, NITA should promptly publish comprehensive information about approved training institutions, certification requirements, examination processes, and the official registry of certified technicians. This information should be accessible through multiple channels including the NITA website, regional offices, industry association networks, and integration into the Biogas Knowledge Management Platform developed through the ABC project in cooperation with the Ministry of Energy and Petroleum.

6. Establish Sustainable Financing for Training Delivery:

The Ministry of Labour and Industrialisation, working with NITA should develop a sustainable financing model for curriculum delivery that extends beyond donor-funded project timelines. Options include establishing a levy on biogas system installations that funds ongoing training capacity, creating public-private partnerships where biogas companies invest in training infrastructure in exchange for priority access to certified graduates, and integrating biogas training into existing TVET funding mechanisms. The model should ensure geographic accessibility, with training capacity distributed across regions to reduce barriers for rural participants.



A farmer stirring biodigester feed with a shovel

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IMPLEMENTATION CONSIDERATIONS

Need for Institutional Ownership

Successful curriculum implementation will require careful attention to ownership, stakeholder commitment, and policy process alignment. The curriculum must be owned by Kenyan institutions primarily NITA in partnership with relevant ministries rather than remaining dependent on external project management. This institutional ownership ensures sustainability beyond donor funding cycles and embeds the curriculum within Kenya's broader TVET and professional certification ecosystem.

The transition from project-supported training to sustainable institutional delivery represents the greatest implementation challenge. The ABC project's September 2026 conclusion means that external technical assistance and financial support will phase out just as curriculum implementation scales up. The exit strategy must clearly define what institutional capacities need to be in place, what ongoing costs will be incurred, and how these costs will be financed. Early establishment of sustainable financing mechanisms before donor support ends creates the buffer needed for smooth transition.

Alignment of Policy frameworks

Policy system alignment represents a critical success factor. The curriculum gazettelement process must navigate existing regulatory frameworks, coordinate across multiple ministries with overlapping mandates, and integrate with related policies including the National Bioenergy Strategy and Kenya National Cooking Transition Strategy. This requires sustained engagement with policymakers, clear articulation of how biogas workforce development supports broader government objectives, and strategic sequencing of regulatory approvals.

Sustained Stakeholder commitment

Stakeholder commitment must extend beyond initial enthusiasm to sustain implementation support. This includes financial commitment to training delivery, willingness of biogas companies to preferentially hire certified technicians (creating employment incentives for certification), and dedication from training institutions to maintain quality standards. The multi-stakeholder coalition

recommended above provides the mechanism for maintaining this commitment through regular engagement, shared problem-solving, and collective accountability for implementation progress. Geographic equity in training access must be actively managed. Kenya's biogas potential is concentrated in rural agricultural areas with dairy farming and adequate water availability regions that may have limited access to established training institutions. Mobile training units, regional training centers, and partnerships with county governments can help ensure that aspiring technicians in biogas-appropriate regions can access certification pathways without relocating to urban centers. The ABC project's regional training approach across six geographic clusters provides a model for distributed capacity building.

Attention to Gender, Disability and Social Inclusion (GEDSI) Considerations

Gender inclusion requires intentional strategies rather than assuming equal participation will occur naturally. The current 22-34% female participation in training and employment represents progress but remains below gender parity. Targeted recruitment of female participants, addressing practical barriers such as training schedules that accommodate family responsibilities, creating supportive learning environments that counter traditional gender assumptions about technical work, and highlighting successful female biogas technicians as role models can all contribute to increased women's participation. The curriculum coalition should establish specific gender inclusion targets and regularly monitor progress.

Sustained Quality Assurance

Quality assurance mechanisms must be embedded in implementation from the outset. This includes regular auditing of training delivery to ensure curriculum fidelity, monitoring of examination integrity, verification of certified technicians' work quality through customer satisfaction surveys and technical inspections, and periodic curriculum reviews to incorporate lessons learned and emerging best practices. NITA's regulatory role provides the foundation for these quality assurance functions, but successful implementation requires adequate resourcing and clear accountability structures.

Establishing implementation support mechanisms

Sustained curriculum implementation will also require targeted training support mechanisms, including scholarships and subsidized training opportunities for priority groups. Financial barriers remain a significant constraint for aspiring biogas technicians, particularly youth, women, informal practitioners transitioning through Recognition of Prior Learning and candidates from rural and low low-income regions. The Ministry of Energy of Energy and Petroleum in collaboration with NITA, county governments, industry actors, and development partners, should establish a structured scholarship and cost-sharing framework to support tuition, assessment fees, training materials and certification costs, linking scholarships to labour market demand such as commitments from biogas companies to offer internships or employment to certified graduates will strengthen uptake, improve completion rates and ensure that the curriculum delivers inclusive and workforce relevant outcomes.



A farmer collecting biodigester feed from his cow shed

CALL TO ACTION

To KEREA (Kenya Renewable Energy Association):

- Mobilize industry members to actively support curriculum gazettelement through advocacy letters, stakeholder meeting participation and commitment to preferential hiring of certified technicians.
- Establish KEREA as the primary industry voice championing workforce professionalization and coordinate with other associations to present unified industry positions to policymakers.

To BIO-NET:

- Lead joint lobbying initiatives with KEREA and other sector organizations to accelerate NITA's gazettelement process.
- Leverage BIO-NET's technical expertise and sector credibility to provide evidence-based advocacy materials that demonstrate the curriculum's quality and market necessity.
- Commit to supporting certified technicians through business development resources and market linkages.

To development partners:

- Provide targeted and realistic resources for curriculum validation workshops, stakeholder convening, and technical documentation required for gazettelement.
- Make available comprehensive training materials, pilot evaluation data, and lessons learned documentation developed through the ABC project.
- Support the multi-stakeholder coalition's establishment and initial operations, with clear parameters for transition to industry-led governance before the project's September 2026 conclusion.

To NITA:

- Prioritize the biogas curriculum gazettelement within institutional work plans, allocating necessary staff time and administrative resources to navigate the approval process efficiently.
- Develop detailed implementation guidelines for training institutions, examination administration, and RPL assessments.
- Prepare for rapid scaling once gazettelement is achieved by identifying potential accredited training partners and developing instructor training programmes.

To Ministry of Energy and Petroleum:

- Exercise policy leadership by formally requesting curriculum gazettelement and coordinating inter-ministerial support.
- Integrate certified biogas workforce development into the Kenya National Cooking Transition Strategy's implementation roadmap and ensure alignment with clean cooking financing mechanisms.
- Provide high-level political support that signals government commitment to biogas sector professionalization.

To Ministry of Labour and Industrialisation:

- Align biogas technician certification with broader national workforce development priorities and TVET system reforms.
- Ensure that financing mechanisms for technical training includes provisions for biogas curriculum delivery.
- Support NITA in establishing sustainable funding models that extend beyond project-based support.

To Training Institutions and Universities:

- Begin preparing for curriculum delivery by identifying faculty capacity for biogas training, assessing infrastructure requirements, mobilizing and allocating financial, human and material resources, and expressing formal interest in becoming accredited delivery partners. This should include budgeting for trainer upskilling, training equipment, laboratories or demonstration units, and learning materials.
- Engage proactively with NITA and the curriculum coalition to shape implementation approaches that leverage existing institutional strengths and optimize available resources through partnerships and co-investment where possible.

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4. GIZ,2024. CPE ABC Kenya Evaluation Report 4th Draft Clean. Kenya: GIZ (Page 15;16,36)
5. GIZ,2022. Proposal GIZ LI Kenya February 2022.Kenya. GIZ (Page 15)



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