NEPAL RENEWABLE ENERGY PROGRAMME

Gap analysis on renewable energy and clean cooking in Province 2, Province Lumbini and Province Karnali

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NEPAL
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PROGRAMME

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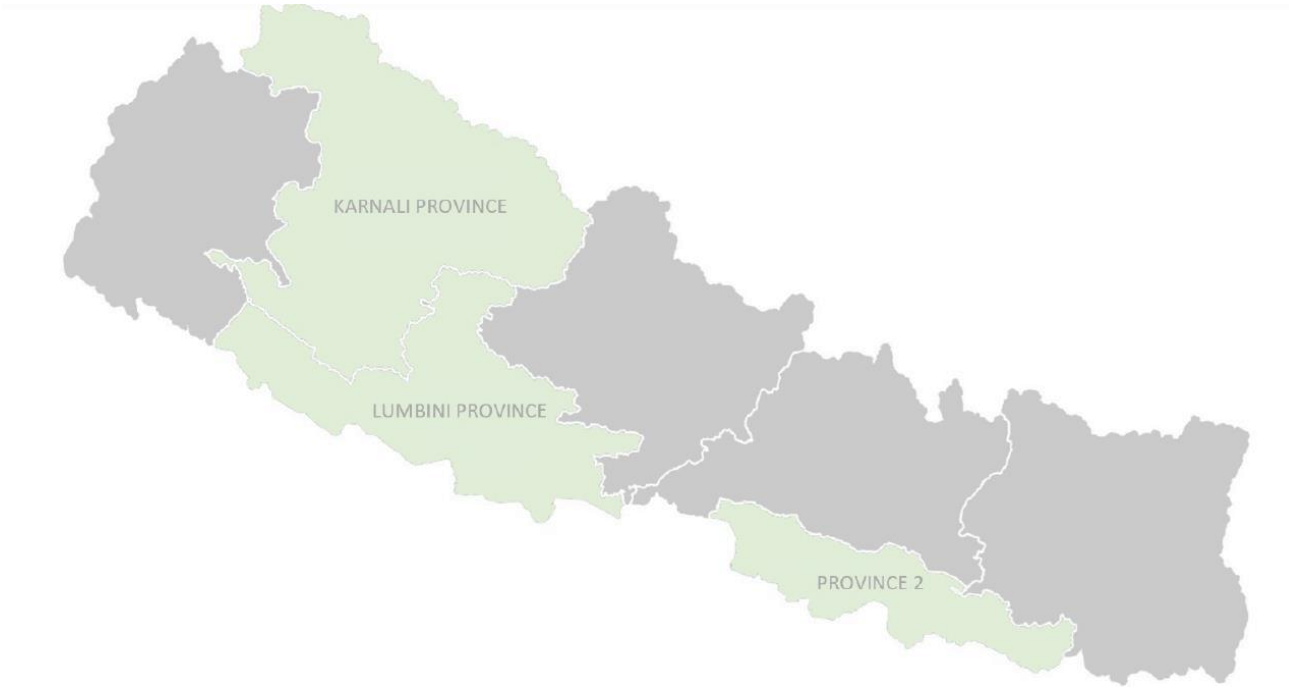


1st Version submitted to UKAID: June 2021

Acronyms

RISE	Regulatory Indicators for Sustainable Energy
RE	Renewable Energy
EE	Energy Efficiency
GoN	Government of Nepal
PV	Photovoltaic
MRV	Monitoring, reporting and verification
avg	Average
PPA	Power Purchase Agreement
SAIFI	System Average Interruption Frequency Index
SAIDI	System Average Interruption Duration INdex
GHG	Green House Gas
HVAC	Heating, ventilation and air conditioining
LEED	Leadership in Energy and Environmental Design
FI	Financing INstitution
TOU	Time of Use
C&I	Commercial and Industrial
kWh	Kilowatt hour

1. Policy framework, pillars and indicators

This paper used 11 indicators across clean cooking and renewable energy as prescribed by RISE and compare policy and regulatory frameworks of Province 2, Province Lumbini and Province Karnali, accounting nearly 43 % of the population, and use scores to assess the province's readiness in achieving the Sustainable Development Goal 7. The RISE indicators are expected to support policy makers to bench mark their provincial energy framework against other provinces as well as the national framework and increase their readiness in attracting investment in their jurisdiction. For private sector, this document provides an illustration on the attractiveness of province's policy for private sector involvement.

Out of the four pillars prescribed by the RISE framework, only two clean cooking and renewable energy are assessed as shown in the table 1. Based on future requests, the remaining two pillars of electricity access and energy efficiency can be assessed. The scores are categorized in three policy readiness categories- i) scores from 67 to 100 indicate advanced policy framework, ii) scores from 33 to 67 indicate intermediate policy framework with rooms for improvement and iii) scores from 0 to 33 indicate an early stage for policy adoption or undeveloped policy framework. Indicators in each pillar are scored between 0 and 100 and are weighted to reach a score for the pillar.

Pillars	**Indicators**			
Renewable Energy	Legal framework for renewable energy	Network connection and use	Planning for RE expansion	Counterparty risk
	Incentives and regulatory support for RE	Carbon pricing and monitoring	Attributes of financial and regulatory incentives	
Clean Cooking	Planning	Scope of planning	Standards and labelling	Incentives for clean cooking solutions

Table 1: Policy evaluation pillars and indicators

2. Progress of National indicator in Clean Cooking and Renewable Energy

Based on the NREP findings[1], Nepal's RISE score for clean cooking has reached 74 while the global average is only 37 and the regional average is 41. Except labeling, all indcators have received scores higher than the global average from 138 RISE partner countries. However, the scores are primarily from improved biomass stoves and household biogas system. For electric stoves, a seperate assessment will be required to make it more relevant.

[1] A. Pradhan 2021, Gap analysis of distributed renewabl energy to attract private sector investment compared to Nepal specific RISE indicators

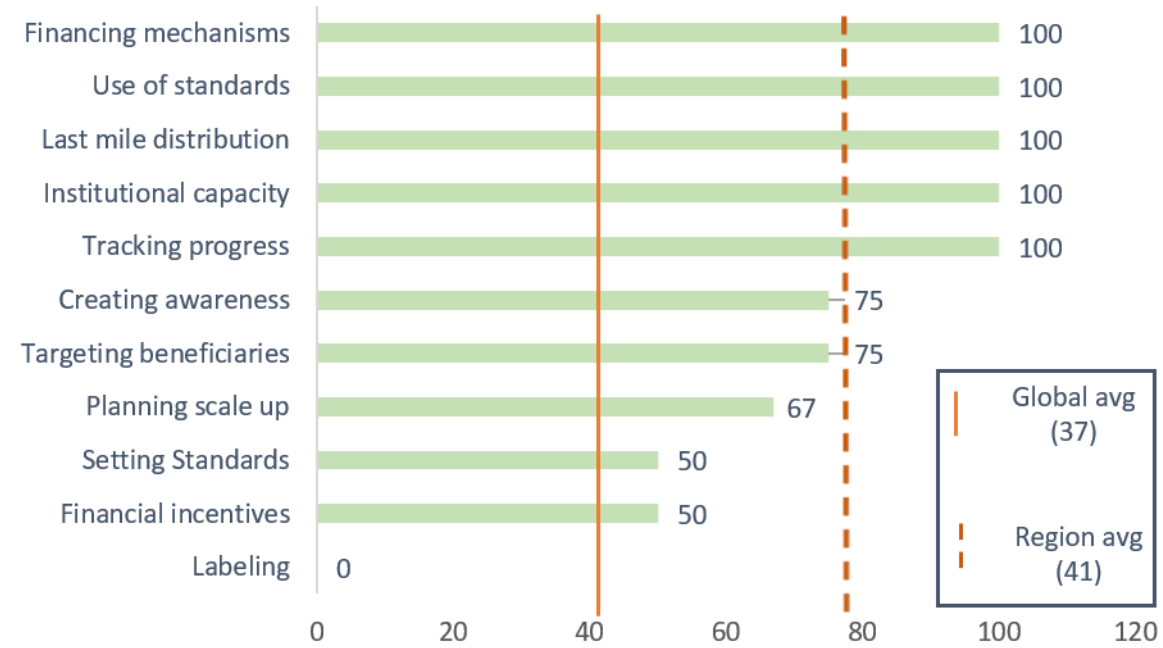


Figure 1: Progress of Renewable Energy of Nepal by Policy Indicator

In Renewable Energy, Nepal received 42 RISE score with only one indicator, i.e. the legal framework, recognized as advanced. Three idicators- attributes of financial and regulatory incentives, counterparty risk and, incentives and regulatory support for RE, have reached intermediate level while rest of the indicators are considered underdeveloped.

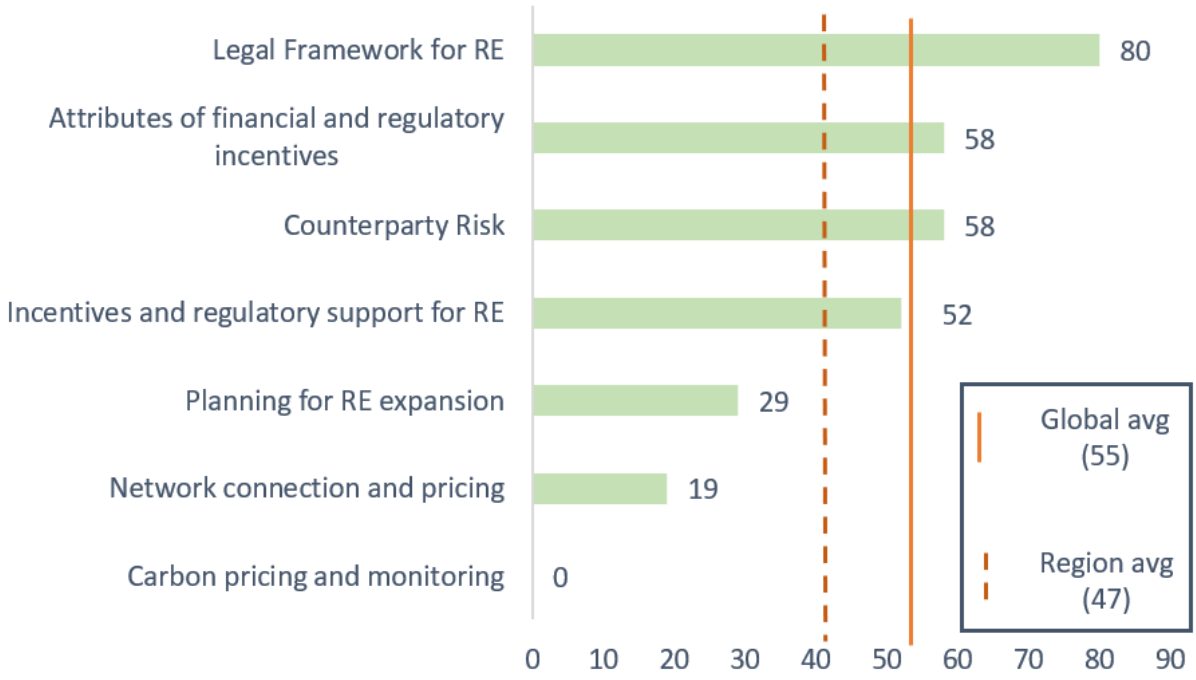
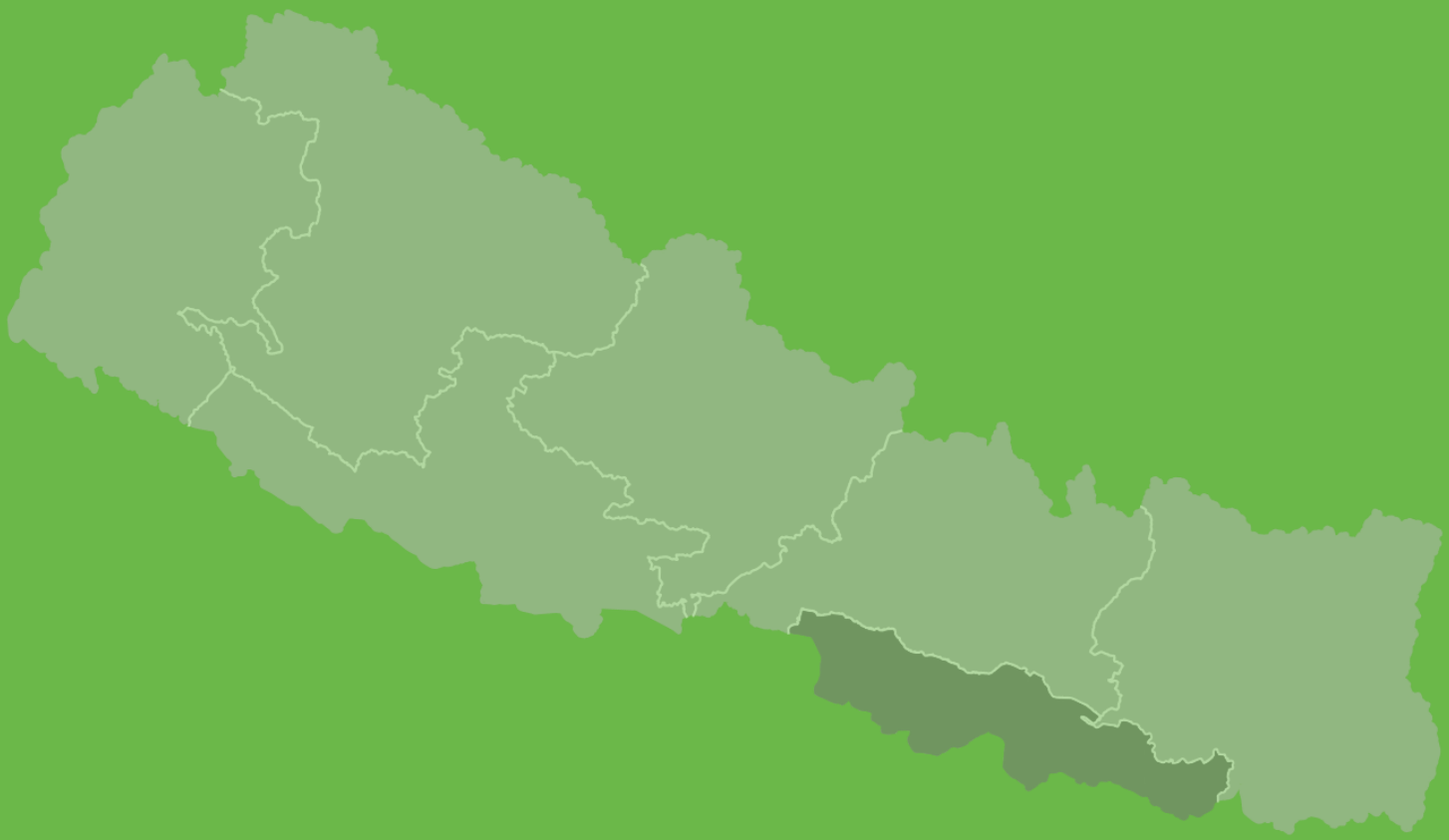


Figure 2: Progress of Clean Cooking of Nepal by Policy Indicator



3. Policy comparison and gaps

3.1 COMPARISION OF NATIONAL POLICY WITH PROVINCE 2

3.1.1 Provincial Indicator in Renewable Energy

Need for development of a legal framework allowing private sector with ownership of RE projects are coined in Provincial Electriciy Act 2077 as well as the province's First Periodic Plan for FY 2076/77 to FY 2080/81. The later document also has an official RE target of 200 MW of Solar electricity generation. On network connection and pricing, the framework is ahead of national framework as the Provincial Electriciy Act 2077 have rules regarding purchase of power directly from third party and the proposed rules can also define the size and allocation for use of transmission and distribution system e.g. wheeling charges.

Related to permissions for RE project development, the Provincial Electricity Act 2077 has set mandatory provision to get approval for new projects of size above 1000 kW. For size from 100 kW to 1000 kW, the Act has mandated to inform the ministry. Similarly, the Act also has provision of bulk purchase of power and its selling and attributed to future rules that will allow electricity customers to purchase power directly from third party and also rules that will define the size and allocation of costs for use of the transmission and distribution system (e.g. wheeling charges). Overall, Province 2 is the only province with an approved electricity Act enabling a stronger legal framework and is relatively advanced compared to Province Lumbini and Province Karnali. However, the overall policy framework is significantly behind both national and regional averages and in general the framework is underdeveloped.

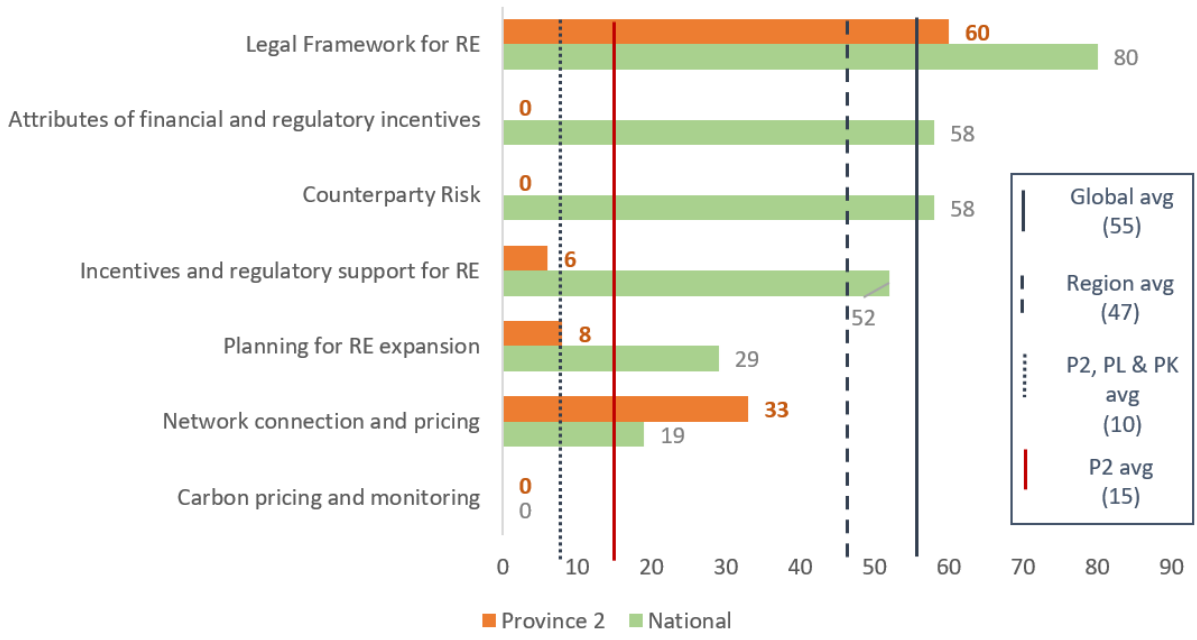


Figure 3: Progress of Renewable Energy of Province 2 by Policy Indicator

3.1.1.1 Gaps by indicator for Renewable Energy of Province 2

The gaps were identified based on the score achieved by each sub-indicator associated with their indictors and their pillars. Following the scoring methodology, sub-indicators which have reached or exceeded 67 have been excluded as they are infereed to have reached advanced

level. Only the sub-indicators receiving 66 and below are considered for gap analysis. Score from 0-33 is red and 34 to 66 is yellow. The table below lists specific gaps that requires actions in order for the sub-indicators to reach the advanced level.

Score	Gaps associated with sub-indicators scoring 66 and below
60	1. Legal framework for RE • The RE target is not legally binding to budgetary targets of any ministry in the province • No RE action plan or strategy to atain the target
8	2. Planning for RE expansion Electricity- targets and plans • No assessment of the role of RE in electricity supply Heating and cooling- targets and plans • No assessment of the needs for heating and cooling in buildings and industry and how RE can contribute • No specific target for RE for heating and cooling Transport- targets and plans • No assessment of the needs for transport and how RE can contribute • There is no specific target for RE for transport Institutions and meeting targets • There is no estimate on the amount necessary to meet the RE target • There is no institution responsible for tracking process in RE development • There is no perioding reporting mechanisms for RE progress • There is no mechanisms for adjusting the plan based on reporting of RE deployment RE in generation and transmission planning • RE generation and transmission planning are not integrated • Information related to planning for RE dispatch is not available • No ministries or division have electricity generation planning with RE development • The gernation plan is not based on probabilistic approach • The current transmission planning does not consider RE scale up Resource data and siting • No ministries or division have carried out geospatial planning or produced zoning guidance to inform commercial development of the RE resource • Since there is no geospatial planning or zoning guidance, so evidence related to best practices by: i) being undertaken as part of a strategic environmental and social assessment or equivalent process; and ii) by making the outputs public available
6	3. incentives and regulatory support for RE Financial and regulatory support for electricity • No provision for province offering long term PPAs for RE electricity production by large scale producers (e.g. via. Feed-in-tariffs, PPAs, awarded through auction etc.)

	• No provision for province offering long term PPAs for RE electricity production by small scale producers (e.g. via. Feed-in-tariffs, PPAs, awarded through auction etc.) • No provision for province offring other direct fiscal incentives for RE (e.g. capital subsidies, grants or rebates, investment tax credits, tax deductions, producting tax credits) Electricity grid access and dispatch • No provision for prioritized access to the grid for RE • No provision for prioritized dispatch to the grid for RE • No provisiosn to compensate seller if offtake infrastructure is not built in time • No mechanisms to compensate RE projects for lost generation due to certain curtailements after project commissioning • No compensation due because of curtailment given out Financial and regulatory support for transport • No policy to encourage the transport sector to adopt cleaner (biofuel, electric, hydrogen) power modes of transportation • No specific financial support measures designed to encourage use of electric/hybrid including 2/3 wheel vehicles, biofules, hydrogen vehicles and electrification of public transportation • No specific regulatory measures deisnged to encourage the use of electric/hybrid including 2/3 wheel vehicles, biofules, hydrogen vehicles and electrification of public transportation Financial and regulatory support for heating and cooling • No policy to encourage depoloyment of any RE heating and cooling technologies • No specific financial support measures designed to encourage the use of RE in the heating and cooling sectors • No specific regulatory measures deisnged to encourage the use of RE in the heaiting and cooling sectors
0	4. Attributes of financial and regulatory incentives Auctions • Information related to use of competition in ensuring large/provincial scale RE generation (projects from 3 – 20 MW) is cost cost competitive (e.g. through auctions for PPAs). So the following information is not available • Schedule for future bids/ auctions available for investors • Pre qualification process to select bidders • Indexed tarff to an international currecy or to inflation • Provisison to ensure full and timely project completion (e.g. bid-bonds, project milestones) • Project award types- auctions/ bids online/ on track to be online on stated date • compliance to deadline for auctions/ bids Fixed tariffs for small producers • Information related to provisions for grid connection for small producers (residential, commercial rooftop PV, etc) are not available • Information related to contracts with fixed tariffs for each producers are not available

	• There is no schedule or clear rules (e.g. capacity based limits) for adjusting the tariff level over time • Different tariffs are not available for different technologies and sizes of the generation plan • There is no mechanism to control the capacity built under each tariff • Tariffs are not indexed (in part or in whole) to an international currency or to inflation
33	5. Network connection and use Connection and cost allocation • The provincial government does not have a grid code that clearly specifies connection procedures • Information related to connection procedures meeting international best practices are not available • Information related to grid code include measures or standards addressing variable renewable energy is not available • Information related to the rules defining the allocation of connection costs • There is not connection cost allocation policy (i.e. shallow/deep) Renewable grid integration • The province has not carried out assessments of the flexibility of the electricity grid and the issues relating to RE integration • RE projects cannot be sold as balancing/ ancillary services • There are no rules for exchanging power between balancing areas that penablize variable RE, e.g. through imbalance penalties • There are no provisions in the power exchange rules that allow for plant forecasting • There country does not integrate high quality forecasting for any vailable RE resources (either through subscription service or provided by national agencies) into their dispatch operations • Information related to dispatch operations carried out in real time is not available
0	6. Counterparty risk Payment risk mitigation • Information related to special purpose entity, is it underwritteb by a government guarantee or other mechanisms to ensure credit worthiness (e.g. through a letter of credit, escrow account, payment guarantee, or other) • Information related to standard PPAs bankable? Utility transparency and monitoring • Information related to financial statements of provincial utility related to generation, transmission, distribution, retail sales etc is not available to provincial governments • Information related to audited by an independent auditor is not available Publication of metrics in a primary official document • Publication of metrics related to generation, transmission, distribution and retail sales are not available • Information related to incidence/ outage recording system (or SCADA/ EMS with such functionality) is not available

	Measurement of SAIDI and SAIFI or any other measurements for service reliability • Information related to measurements reported to the regulatory body is not available • Information related to measurements availability to public is not available
0	7. Carbon pricing and monitoring • There is no GHG emission coverage under any carbon pricing mechanism • There is no monitoring, reporting and verification system for greenhouse gas emissions in place

3.1.2 Provincial Indicator in Clean Cooking

Out of all clean cooking indicators, the Province 2 in their first periodic plan for FY 2076/77 to FY 2080/81 has made commitment in promoting biogas system as part of their clean cooking initiative. There is no policy mechanisms or measures in place for rest of the indicators including planning, scoping, standards, labeling and incentives. The policy of Province 2 is significantly behind both national and regional averages and in general the framework is underdeveloped.

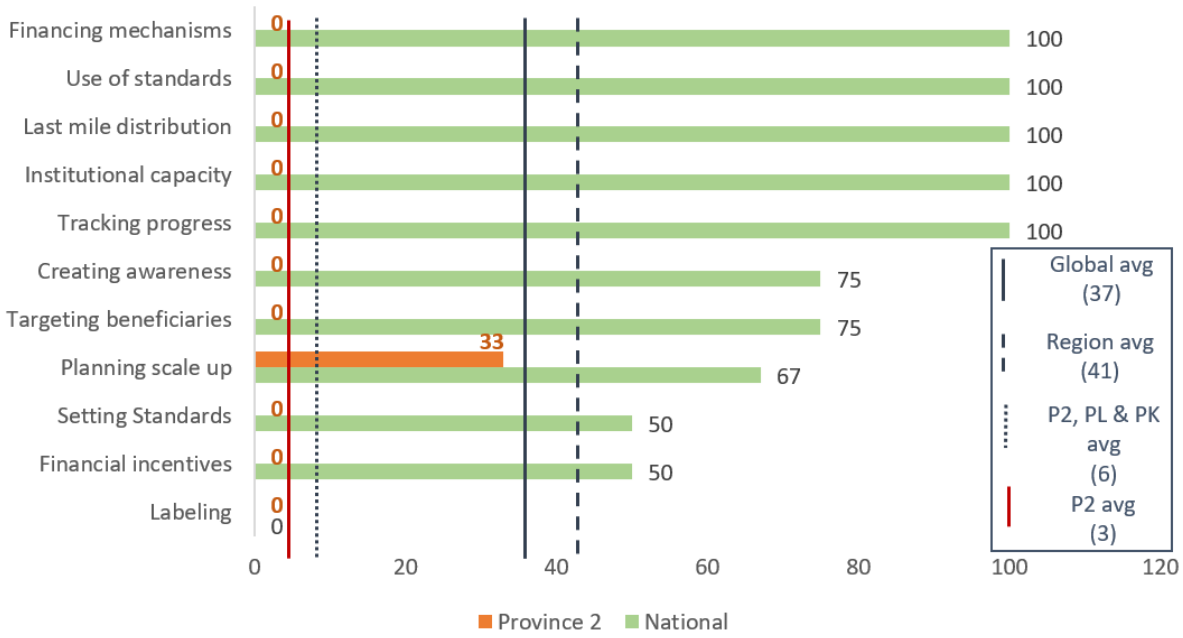


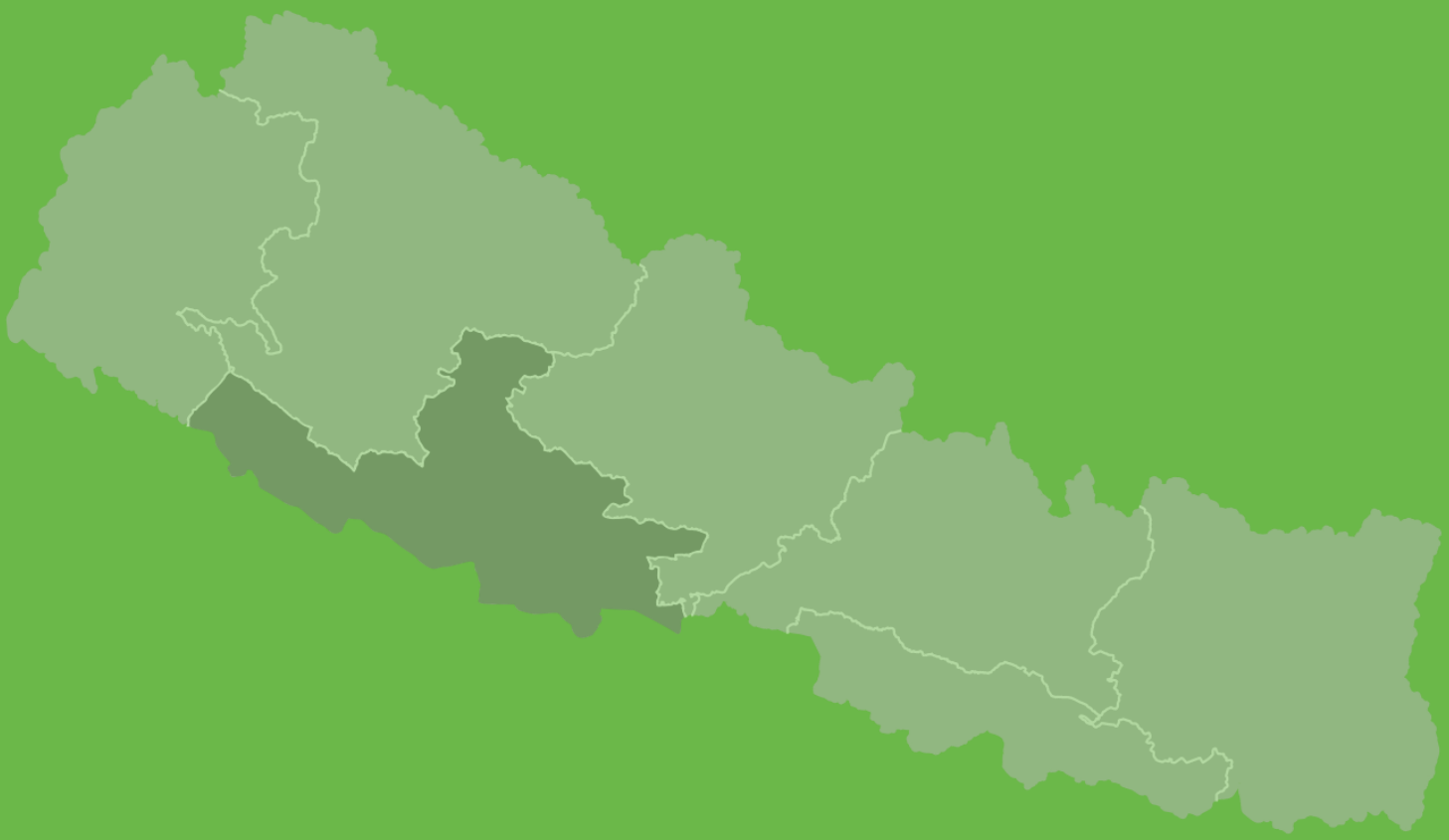
Figure 4: Progress of Clean Cooking of Province 2 by Policy Indicator

3.1.2.1 Gaps by indicator for Clean Cooking of Province 2

The gaps were identified based on the score achieved by each sub-indicator associated with their indictors and their pillars. Following the scoring methodology, sub-indicators which have reached or exceeded 67 have been excluded as they are infereed to have reached advanced level. Only the sub-indicators receiving 66 and below are considered for gap analysis. Score from 0-33 is red and 34 to 66 is yellow. The table below lists specific gaps that requires actions in order for the sub-indicators to reach the advanced level.

Score	Gaps associated with sub-indicators scoring 66 and below
33	1. Planning Tracking • Province does not have tracking of household level data on cooking solutions • Data are not available publicly Institutional capacity • No dedicated institution or agency for • setting clean cooking/ action plan, • setting monitoring and enforcing standards for clean cooking solutiosn and • tracking access and adoption of clean cooking solutions
0	2. Scoping of planning Aspects of the plan • There is no plan included in any of the goal of the province for reaching universal access to clean cooking for the population targeted in the plan • There is no plan accounting geographical and demographical considerations • There is no plan including considerations and action items for involving women throughout the supply chain of clean cooking solutions • There is no plan prioritizing the most vulnerable consumers • There is no planc incetivizing transition to Tier 3 and above cooking fuels and technologies Awareness strategy • There is no targeted awareness raising strategy to drive adoption of clean cooking solution • There is no strategy taking into account geographical and demographical considerations • There is no strategy having targeted messages for both men and women • There is no strategy including health aspects • There is no strategy aiming to involve local community organizations Last mile distribution • These is no last mile distribution strategy in place for cooking fuels • There is no last mile distribution strategy in place for cooking technologies
0	**3. Standards and labeling** **Standards** • There are no standards for the aspect of efficiency, emissions and safety of clean cooking solutions Monitoring and Verification • There are no mandatory standards with a verification and enforcement procedure • There is no program working with standards testing facility or lab • There is no stove testing facility or lab needed to be accredited • There is no field testing for standard verification Labeling

	• There are no labeling schemes adoption on clean cooking products for efficiency of clean cooking products • There are no labeling scehmes adopted on clean cooking products for emissions of clean cooking products
0	**Incentives and attributes** **Financing mechanisms** • There are no specific financing facilities available to support suppliers/ consumers to develop/ purchase clean cooking solutions • There are no specific financing or subsidy programs for clean cooking solutions targeted to low income consumers **Supplier incentives** • There are no duty exemptions, tax benefits, and/or subsidies to support clean cooking solutions • There are no programs for commercial entities to invest in efficient, low-emission stoves



3.2 COMPARISION OF NATIONAL POLICY WITH PROVINCE LUMBINI

3.2.1 Provincial Indicator in Renewable Energy

The Province Lumbini does not have a legal framework for RE so it does not have a clear framework to allow private sector ownership of RE generation. With no official RE target, there are not legally binding targets or any linkage with national targets and commitments. For rural electricity, the province made target in providing electricity access to all off-grid households through solar home system by FY 2078/79. For use of RE in transport, MoPID has allocated budget for installation of EV charging stations but a specific target for RE based transport is missing.

The Provincial government, specifically the MoPID, reflect the progress of tracking RE development in their quarterly progress reports. Regarding resource data, the periodic plan envisaged in developing public land for solar farm, however specific geospatial planning or any zonig guidance to inform the commercial development of the RE resource is yet to be developed. On project permissions, the government made announcement on providing guidance and permissions requirements to developers through their annual plan and policies. Finally on financial incentive, the MoPID has scheme in providing direct financial incentive of 90 % of the total cost of solar home system to the users. The policy of Province Lumbini is significantly behind both national and regional averages and in general the framework is underdeveloped.

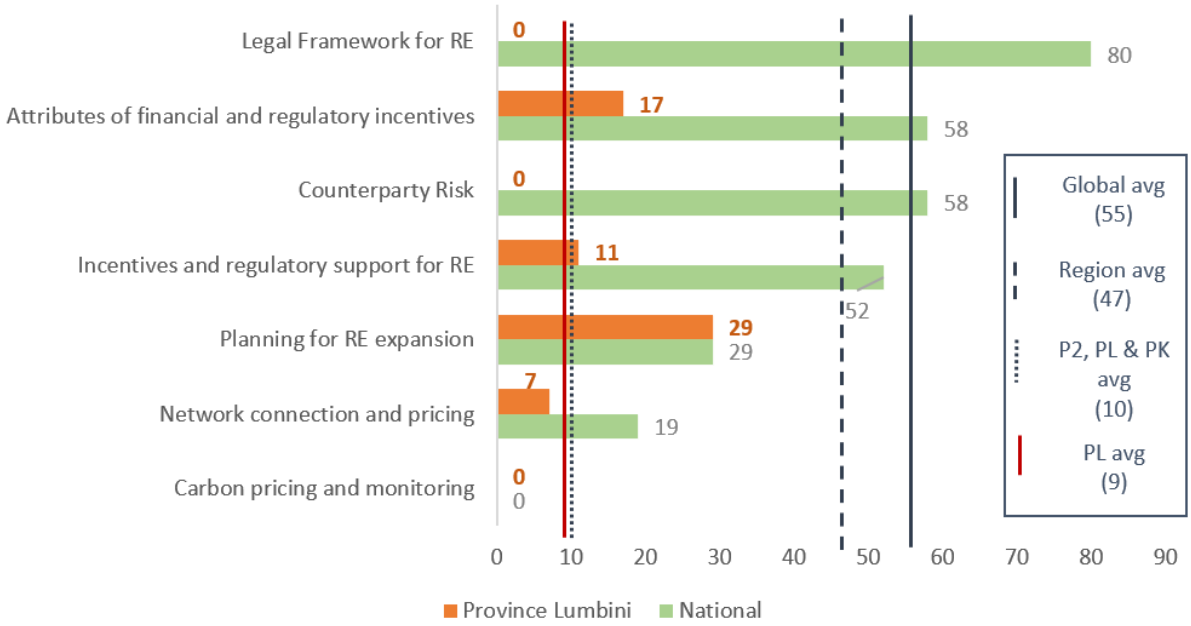


Figure 5: Progress of Renewable Energy of Province Lumbini by Policy Indicator

3.2.1.1 Gaps by indicator for Renewable Energy of Province Lumbini

The gaps were identified based on the score achieved by each sub-indicator associated with their indictors and their pillars. Following the scoring methodology, sub-indicators which have reached or exceeded 67 have been excluded as they are infereed to have reached advanced level. Only the sub-indicators receiving 66 and below are considered for gap analysis. Score

from 0-33 is red and 34 to 66 is yellow. The table below lists specific gaps that requires actions in order for the sub-indicators to reach the advanced level.

Score	Gaps associated with sub-indicators scoring 66 and below
0	1. Legal framework for RE • There is no legal framework allowing private sector ownership of RE generation • There is no official RE target (only available for electricity) in the province • The RE target is not legally binding to budgetary targets of any ministry in the province • There is no linkage of RE target with national commitments • No RE action plan or strategy to atain the target
29	2. Planning for RE expansion Electricity- targets and plans • No assessment of the role of RE in electricity supply Heating and cooling- targets and plans • No assessment of the needs for heating and cooling in buildings and industry and how RE can contribute • No specific target for RE for heating and cooling Transport- targets and plans • No assessment of the needs for transport and how RE can contribute Institutions and meeting targets • There is no estimate on the amount necessary to meet the RE target • There is no institution responsible for tracking process in RE development • There is no mechanisms for adjusting the plan based on reporting of RE deployment RE in generation and transmission planning • RE generation and transmission planning are not integrated • Information related to planning for RE dispatch is not available • There is no generation planning including RE development • No ministries or division have electricity generation planning with RE development • The gernation plan is not based on probabilistic approach • The current transmission planning does not consider RE scale up Resource data and siting • Since there is no geospatial planning or zoning guidance, so evidence related to best practices by: i) being undertaken as part of a strategic environmental and social assessment or equivalent process; and ii) by making the outputs public available
11	3. incentives and regulatory support for RE Financial and regulatory support for electricity • No provision for province offering long term PPAs for RE electricity production by large scale producers (e.g. via. Feed-in-tariffs, PPAs, awarded through auction etc.)

	• No provision for province offering long term PPAs for RE electricity production by small scale producers (e.g. via. Feed-in-tariffs, PPAs, awarded through auction etc.) • No provision for province offering other direct fiscal incentives for RE (e.g. capital subsidies, grants or rebates, investment tax credits, tax deductions, producting tax credits) Electricity grid access and dispatch • No provision for prioritized access to the grid for RE • No provision for prioritized dispatch to the grid for RE • No mechanisms to compensate RE projects for lost generation due to certain curtailements after project commissioning • No compensation due because of curtailment given out Financial and regulatory support for transport • No policy to encourage the transport sector to adopt cleaner (biofuel, electric, hydrogen) power modes of transportation • No specific financial support measures designed to encourage use of electric/hybrid including 2/3 wheel vehicles, biofules, hydrogen vehicles and electrification of public transportation • No specific regulatory measures deisnged to encourage the use of electric/hybrid including 2/3 wheel vehicles, biofules, hydrogen vehicles and electrification of public transportation • However, there is budget for EV charging station installation is available Financial and regulatory support for heating and cooling • No policy to encourage depoloyment of any RE heating and cooling technologies • No specific financial support measures designed to encourage the use of RE in the heating and cooling sectors • No specific regulatory measures deisnged to encourage the use of RE in the heaiting and cooling sectors
17	4. Attributes of financial and regulatory incentives Auctions • Information related to use of competition in ensuring large/provincial scale RE generation (projects from 3 – 20 MW) is cost cost competitive (e.g. through auctions for PPAs). So the following information is not available • Schedule for future bids/ auctions available for investors • Pre qualification process to select bidders • Indexed tarff to an international currecy or to inflation • Provisison to ensure full and timely project completion (e.g. bid-bonds, project milestones) • Project award types- auctions/ bids online/ on track to be online on stated date • compliance to deadline for auctions/ bids Fixed tariffs for small producers • There is no schedule or clear rules (e.g. capacity based limits) for adjusting the tariff level over time • Different tariffs are not available for different technologies and sizes of the generation plan • There is no mechanism to control the capacity built under each tariff

	• Tariffs are not indexed (in part or in whole) to an international currency or to inflation
7	5. Network connection and use Connection and cost allocation • The provincial government does not have a grid code that clearly specifies connection procedures • Information related to connection procedures meeting international best practices are not available • Information related to grid code include measures or standards addressing variable renewable energy is not available • There is not connection cost allocation policy (i.e. shallow/deep) Network usage and pricing • There are no rules that allow electricity customers to purchase power directly from a third party • There is no rules defining the size and allocation of costs for use of the transmission and distribution system (e.g. wheeling charges, locational pricing, etc.) Renewable grid integration • The province has not carried out assessments of the flexibility of the electricity grid and the issues relating to RE integration • RE projects cannot be sold as balancing/ ancillary services • There are no rules for exchanging power between balancing areas that penablize variable RE, e.g. through imbalance penalties • There are no provisions in the power exchange rules that allow for plant forecasting • There country does not integrate high quality forecasting for any vailable RE resources (either through subscription service or provided by national agencies) into their dispatch operations • Information related to dispatch operations carried out in real time is not available
0	6. Counterparty risk Payment risk mitigation • Information related to special purpose entity, is it underwritteb by a government guarantee or other mechanisms to ensure credit worthiness (e.g. through a letter of credit, escrow account, payment guarantee, or other) • Information related to standard PPAs bankable? Utility transparency and monitoring • Information related to financial statements of provincial utility related to generation, transmission, distribution, retail sales etc is not available to provincial governments • Information related to audited by an independent auditor is not available Publication of metrics in a primary official document • Publication of metrics related to generation, transmission, distribution and retail sales are not available • Information related to incidence/ outage recording system (or SCADA/ EMS with such functionality) is not available

	Measurement of SAIDI and SAIFI or any other measurements for service reliability • Information related to measurements reported to the regulatory body is not available • Information related to measurements availability to public is not available
0	7. Carbon pricing and monitoring • There is no GHG emission coverage under any carbon pricing mechanism • There is no monitoring, reporting and verification system for greenhouse gas emissions in place

3.2.2 Provincial Indicator in Clean Cooking

The policy frameworks of the Province Lumbini in planning, scoping, standards and labeling is underdeveloped due to which the province does not have adequate capability to track, plan, identify prioritiy areas, implement standards and use these to incentivize private sector for service expansion. The province, through its annual budget, frequently announce provision for cash contribution, excluding kind contribution, as a financing mechanism to support consumers to purchase clean cooking stoves. With nearly XX % under poverty and YY % with conventional firewood based cooking stoves, the policy of Province Lumbini is significantly behind both national and regional averages and in general the framework is underdeveloped.

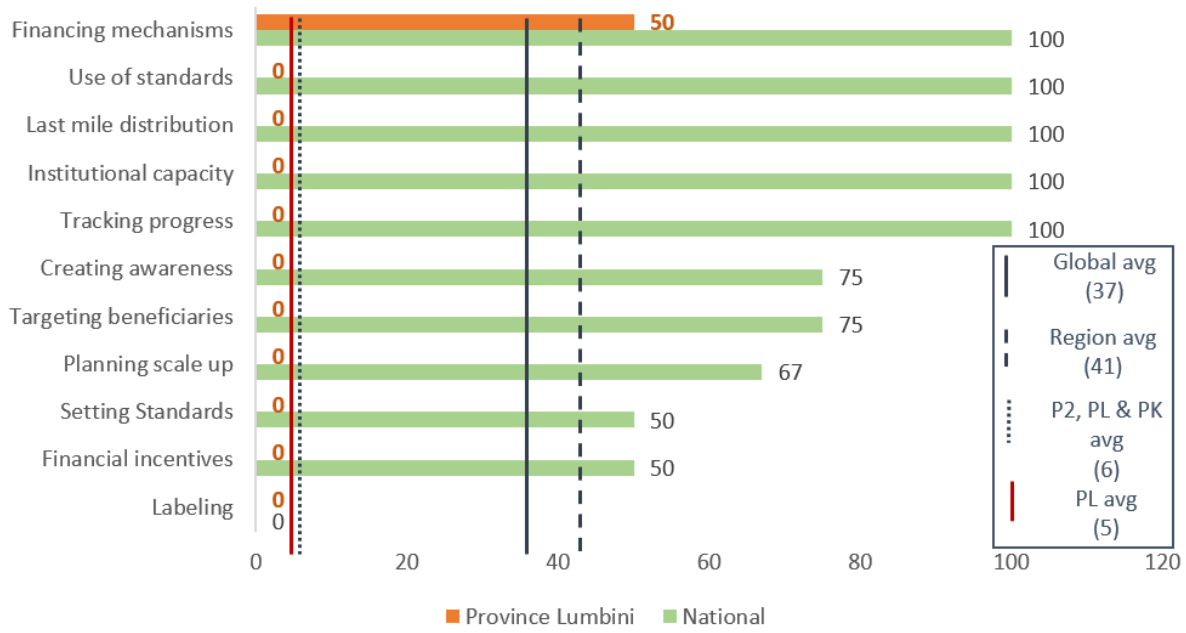


Figure 6: Progress of Clean Cooking of Province Lumbini by Policy Indicator

3.2.2.1 Gaps by indicator for Clean Cooking of Province Lumbini

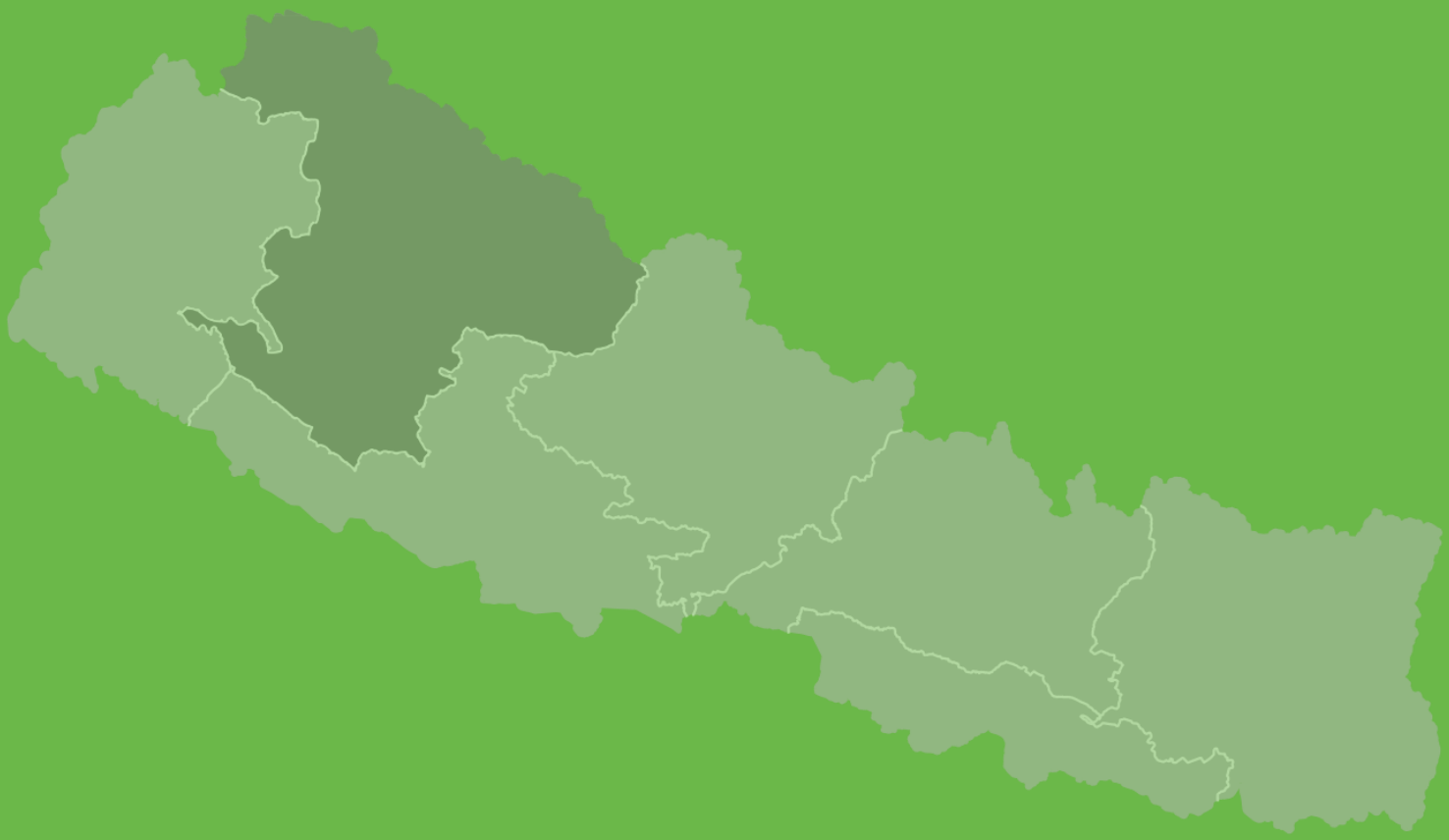
The gaps were identified based on the score achieved by each sub-indicator associated with their indictors and their pillars. Following the scoring methodology, sub-indicators which have reached or exceeded 67 have been excluded as they are infereed to have reached advanced level. Only the sub-indicators receiving 66 and below are considered for gap analysis. Score from 0-33 is red and 34 to 66 is yellow. The table below lists specific gaps that requires actions in order for the sub-indicators to reach the advanced level.

Score	Gaps associated with sub-indicators scoring 66 and below

0	1. Planning
	
	Tracking
	• Province does not have tracking of household level data on cooking solutions
	• Data are not available publicly
	
	Existance of plan
	• There is no plan to scale up access to clean cooking solutions, or is access to clean cooking solutions covered as a part of any other government plan
	• There is no plan currently in use allocate resources for implementation
	• There is no public consultation during preparation of the plan
	
	Institutional capacity
	• No dedicated institution or agency for
	  ○ setting clean cooking/ action plan,
	  ○ setting monitoring and enforcing standards for clean cooking solutiosn and
	  ○ tracking access and adoption of clean cooking solutions

0	2. Scoping of planning Aspects of the plan • There is no plan included in any of the goal of the province for reaching universal access to clean cooking for the population targeted in the plan • There is no plan accounting geographical and demographical considerations • There is no plan including considerations and action items for involving women throughout the supply chain of clean cooking solutions • There is no plan prioritizing the most vulnerable consumers • There is no planc incetivizing transition to Tier 3 and above cooking fuels and technologies Awareness strategy • There is no targeted awareness raising strategy to drive adoption of clean cooking solution • There is no strategy taking into account geographical and demographical considerations • There is no strategy having targeted messages for both men and women • There is no strategy including health aspects • There is no strategy aiming to involve local community organizations Last mile distribution • These is no last mile distribution strategy in place for cooking fuels • There is no last mile distribution strategy in place for cooking technologies
0	**3. Standards and labeling** **Standards** • There are no standards for the aspect of efficiency, emissions and safety of clean cooking solutions Monitoring and Verification

	• There are no mandatory standards with a verification and enforcement procedure • There is no program working with standards testing facility or lab • There is no stove testing facility or lab needed to be accredited • There is no field testing for standard verification Labeling • There are no labeling schemes adoption on clean cooking products for efficiency of clean cooking products • There are no labeling scehmes adopted on clean cooking products for emissions of clean cooking products
25	**Incentives and attributes** **Financing mechanisms** • There are no specific financing or subsidy programs for clean cooking solutions targeted to low income consumers **Supplier incentives** • There are no duty exemptions, tax benefits, and/or subsidies to support clean cooking solutions • There are no programs for commercial entities to invest in efficient, low-emission stoves



3.3 COMPARISION OF NATIONAL POLICY WITH PROVINCE KARNALI

3.3.1 Provincial Indicator in Renewable Energy

Province Karnali has targeted in reaching 100 % of the household through clean energy by by the end of their five year plan period. The province has yet to have a legal framework for RE with legally binding targets and linkage with national targets. Although the plan document aims to achive high level of RE, there is no RE action plan or a specific strategy to attain the target. For use of RE in transport, the 5 year plan document has aimed to mobilize private sector in EV promotion whereby supporting establishment of charging station in the province. As part of incentives, the province is limited in giving subsidies for electrification through the Karnali Ujyalo Program announced in FY 2078/79.

Overall, the province is significantly behind global, regional as well as provincial average of Province 2, Province Lumbini and the Province Karnali itself. Thus, the policy framework in general is underdeveloped.

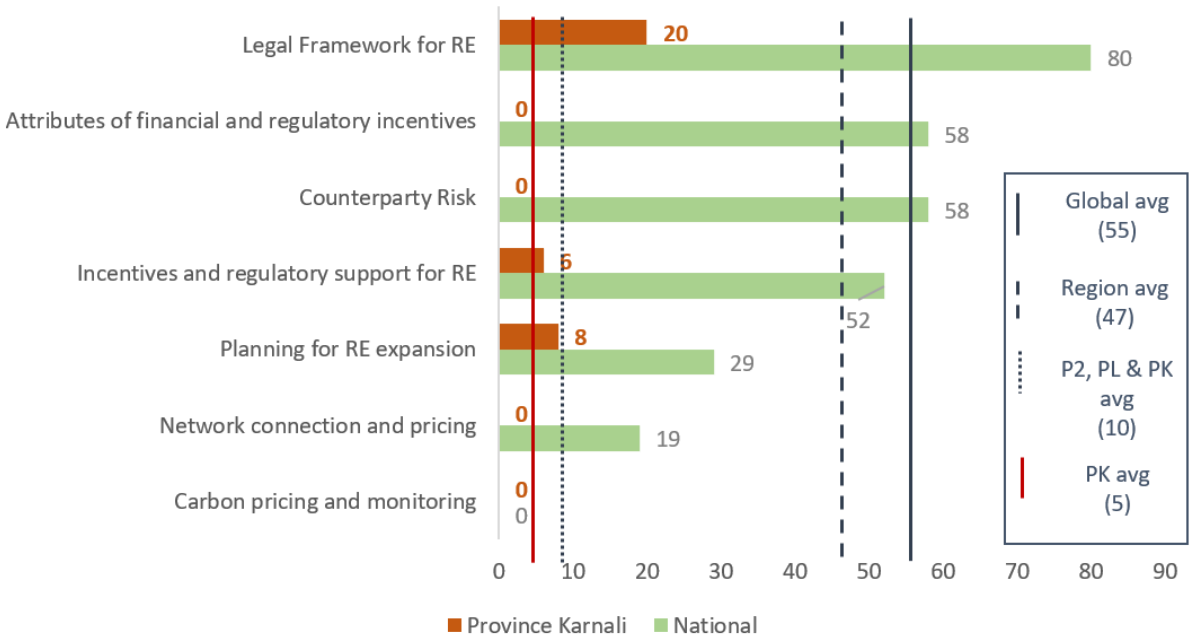


Figure 7: Progress of Renewable Energy of Province Karnali by Policy Indicator

3.3.1.1 Gaps by indicator for Renewable Energy of Province Karnali

The gaps were identified based on the score achieved by each sub-indicator associated with their indictors and their pillars. Following the scoring methodology, sub-indicators which have reached or exceeded 67 have been excluded as they are infereed to have reached advanced level. Only the sub-indicators receiving 66 and below are considered for gap analysis. Score from 0-33 is red and 34 to 66 is yellow. The table below lists specific gaps that requires actions in order for the sub-indicators to reach the advanced level.

Score	Gaps associated with sub-indicators scoring 66 and below
20	1. Legal framework for RE • There is no legal framework for RE allowing private sector ownership of RE generation

	• The RE target is not legally binding to budgetary targets of any ministry in the province • The RE target is linked to national commitments • No RE action plan or strategy to attain the target
8	2. Planning for RE expansion Electricity- targets and plans • No assessment of the role of RE in electricity supply • There is no target for renewables in electricity Heating and cooling- targets and plans • No assessment of the needs for heating and cooling in buildings and industry and how RE can contribute • No specific target for RE for heating and cooling Transport- targets and plans • No assessment of the needs for transport and how RE can contribute Institutions and meeting targets • There is no estimate on the amount necessary to meet the RE target • There is no institution responsible for tracking process in RE development • There is no perioding reporting mechanisms for RE progress • There is no mechanisms for adjusting the plan based on reporting of RE deployment RE in generation and transmission planning • RE generation and transmission planning are not integrated • Information related to planning for RE dispatch is not available • No ministries or division have electricity generation planning with RE development • The generation plan is not based on probabilistic approach • The current transmission planning does not consider RE scale up Resource data and siting • No ministries or division have carried out geospatial planning or produced zoning guidance to inform commercial development of the RE resource • Since there is no geospatial planning or zoning guidance, so evidence related to best practices by: i) being undertaken as part of a strategic environmental and social assessment or equivalent process; and ii) by making the outputs public available
6	3. incentives and regulatory support for RE Financial and regulatory support for electricity • No provision for province offering long term PPAs for RE electricity production by large scale producers (e.g. via. Feed-in-tariffs, PPAs, awarded through auction etc.) • No provision for province offering long term PPAs for RE electricity production by small scale producers (e.g. via. Feed-in-tariffs, PPAs, awarded through auction etc.) • Thre is no clear and practical guidance published by province on what permissions are required to develop a RE electricity project

	Electricity grid access and dispatch • No provision for prioritized access to the grid for RE • No provision for prioritized dispatch to the grid for RE • No provisiosn to compensate seller if offtake infrastructure is not built in time • No mechanisms to compensate RE projects for lost generation due to certain curtailements after project commissioning • No compensation due because of curtailment given out Financial and regulatory support for transport • No policy to encourage the transport sector to adopt cleaner (biofuel, electric, hydrogen) power modes of transportation • No specific financial support measures designed to encourage use of electric/hybrid including 2/3 wheel vehicles, biofules, hydrogen vehicles and electrification of public transportation • No specific regulatory measures deisnged to encourage the use of electric/hybrid including 2/3 wheel vehicles, biofules, hydrogen vehicles and electrification of public transportation Financial and regulatory support for heating and cooling • No policy to encourage depoloyment of any RE heating and cooling technologies • No specific financial support measures designed to encourage the use of RE in the heating and cooling sectors • No specific regulatory measures deisnged to encourage the use of RE in the heaiting and cooling sectors

0	4. Attributes of financial and regulatory incentives
	
	Auctions
	• Information related to use of competition in ensuring large/provincial scale RE generation (projects from 3 – 20 MW) is cost cost competitive (e.g. through auctions for PPAs). So the following information is not available
	  ○ Schedule for future bids/ auctions available for investors
	  ○ Pre qualification process to select bidders
	  ○ Indexed tarff to an international currecy or to inflation
	  ○ Provisison to ensure full and timely project completion (e.g. bid-bonds, project milestones)
	  ○ Project award types- auctions/ bids online/ on track to be online on stated date
	  ○ compliance to deadline for auctions/ bids
	
	Fixed tariffs for small producers
	• Information related to provisions for grid connection for small producers (residential, commercial rooftop PV, etc) are not available
	• Information related to contracts with fixed tariffs for each producers are not available
	• There is no schedule or clear rules (e.g. capacity based limits) for adjusting the tariff level over time
	• Different tariffs are not available for different technologies and sizes of the generation plan
	• There is no mechanism to control the capacity built under each tariff

	• Tariffs are not indexed (in part or in whole) to an international currency or to inflation
33	5. Network connection and use Connection and cost allocation • The provincial government does not have a grid code that clearly specifies connection procedures • Information related to connection procedures meeting international best practices are not available • Information related to grid code include measures or standards addressing variable renewable energy is not available • Information related to the rules defining the allocation of connection costs • There is not connection cost allocation policy (i.e. shallow/deep) Network usage and pricing • There are no rules that allow electricity customers to purchase power directly from a third party • There is no rules defining the size and allocation of costs for use of the transmission and distribution system (e.g. wheeling charges, locational pricing, etc.) Renewable grid integration • The province has not carried out assessments of the flexibility of the electricity grid and the issues relating to RE integration • RE projects cannot be sold as balancing/ ancillary services • There are no rules for exchanging power between balancing areas that penablize variable RE, e.g. through imbalance penalties • There are no provisions in the power exchange rules that allow for plant forecasting • There country does not integrate high quality forecasting for any vailable RE resources (either through subscription service or provided by national agencies) into their dispatch operations • Information related to dispatch operations carried out in real time is not available
0	6. Counterparty risk Payment risk mitigation • Information related to special purpose entity, is it underwritteb by a government guarantee or other mechanisms to ensure credit worthiness (e.g. through a letter of credit, escrow account, payment guarantee, or other) • Information related to standard PPAs bankable? Utility transparency and monitoring • Information related to financial statements of provincial utility related to generation, transmission, distribution, retail sales etc is not available to provincial governments • Information related to audited by an independent auditor is not available Publication of metrics in a primary official document

	• Publication of metrics related to generation, transmission, distribution and retail sales are not available • Information related to incidence/ outage recording system (or SCADA/ EMS with such functionality) is not available Measurement of SAIDI and SAIFI or any other measurements for service reliability • Information related to measurements reported to the regulatory body is not available • Information related to measurements availability to public is not available
0	7. Carbon pricing and monitoring • There is no GHG emission coverage under any carbon pricing mechanism • There is no monitoring, reporting and verification system for greenhouse gas emissions in place

3.3.2 Provincial Indicator in Clean Cooking

Province Karnali has used secondary data to track household level data on cooking solutions and used it as a baseline in their five year plan document. Apart from this, the actual plan for scaling up and implementation are not available. There is no dedicated agency for development and implementation of clean cooking in the province. The scope of planning for clean cooking including a specific goal, accountability of geographical and demographical considerations, prioritization of vulnerable consumers, last mile distribution and awareness strategy are virtually non-existent. Regarding standards and labeling, there are no provincial level policy to either develop or use nationally available guidelines. On financing mechanism, SNV Nepal is implementing it subsidy mechanism by giving direct grant to users or committee for adoption of electric cooking. The program is also jointly implementing subsidy based cooking promotion with selected local governments.

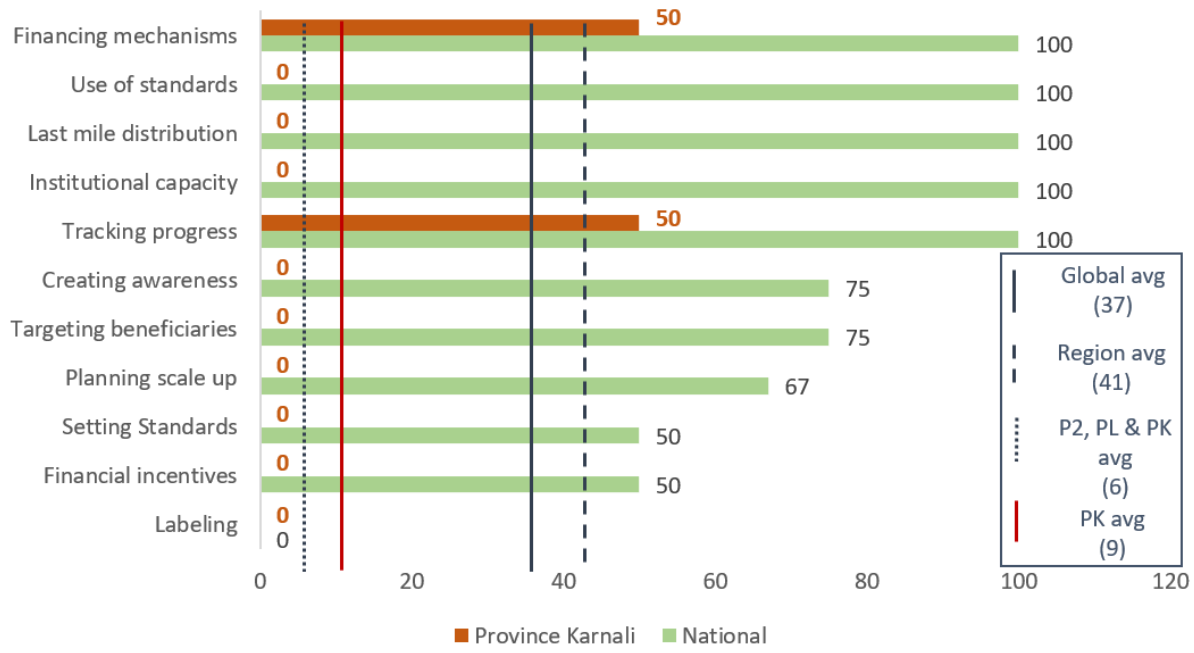


Figure 8: Progress of Clean Cooking of Province Karnali by Policy Indicator

3.3.2.1 Gaps by indicator for Clean Cooking of Province Karnali

The gaps were identified based on the score achieved by each sub-indicator associated with their indictors and their pillars. Following the scoring methodology, sub-indicators which have reached or exceeded 67 have been excluded as they are infereed to have reached advanced level. Only the sub-indicators receiving 66 and below are considered for gap analysis. Score from 0-33 is red and 34 to 66 is yellow. The table below lists specific gaps that requires actions in order for the sub-indicators to reach the advanced level.

Score	Gaps associated with sub-indicators scoring 66 and below
33	1. Planning Existance of plan • There is no plan to scale up access to clean cooking solutions, or is access to clean cooking solutions covered as a part of any other government plan • There is no plan currently in use allocate resources for implementation • There is no public consultation during preparation of the plan Institutional capacity • No dedicated institution or agency for • setting clean cooking/ action plan, • setting monitoring and enforcing standards for clean cooking solutiosn and • tracking access and adoption of clean cooking solutions
0	2. Scoping of planning Aspects of the plan • There is no plan included in any of the goal of the province for reaching universal access to clean cooking for the population targeted in the plan • There is no plan accounting geographical and demographical considerations • There is no plan including considerations and action items for involving women throughout the supply chain of clean cooking solutions • There is no plan prioritizing the most vulnerable consumers • There is no planc incetivizing transition to Tier 3 and above cooking fuels and technologies Awareness strategy • There is no targeted awareness raising strategy to drive adoption of clean cooking solution • There is no strategy taking into account geographical and demographical considerations • There is no strategy having targeted messages for both men and women • There is no strategy including health aspects • There is no strategy aiming to involve local community organizations Last mile distribution • These is no last mile distribution strategy in place for cooking fuels • There is no last mile distribution strategy in place for cooking technologies
0	**3. Standards and labeling** **Standards**

	• There are no standards for the aspect of efficiency, emissions and safety of clean cooking solutions Monitoring and Verification • There are no mandatory standards with a verification and enforcement procedure • There is no program working with standards testing facility or lab • There is no stove testing facility or lab needed to be accredited • There is no field testing for standard verification Labeling • There are no labeling schemes adoption on clean cooking products for efficiency of clean cooking products • There are no labeling scehmes adopted on clean cooking products for emissions of clean cooking products
25	**Incentives and attributes** **Financing mechanisms** • There are no specific financing or subsidy programs for clean cooking solutions targeted to low income consumers **Supplier incentives** • There are no duty exemptions, tax benefits, and/or subsidies to support clean cooking solutions • There are no programs for commercial entities to invest in efficient, low-emission stoves

7. Way forward

The document presents specific gaps across the two pillars of renewable energy and clean cooking. Each sub-sector is listed with sets of actions and activities that needs to be fulfilled in order to reach the advanced level of policy framework. Enabling these sub-indicators to reach the advanced level will increase the attractiveness of private sectors to invest. The way forward is to develop a detail issue logs and using it to either reform the existing policies or to introduce a new policy as a whole. It is also recommended to develop an action plan to reflect these according to timeline, preferably as a short (1 year), medium (1-3 years) and long (above 3 years).