

**MINISTRY OF SCIENCE AND TECHNOLOGY  
VIETNAM INSTITUTE OF SCIENCE TECHNOLOGY AND INNOVATION**

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**DANG THU GIANG**

**STAKEHOLDER ENGAGEMENT IN SCIENCE  
TECHNOLOGY AND INNOVATION POLICY-MAKING  
PROCESS FROM TRANSFORMATIVE INNOVATION  
POLICY PARADIGM IN RENEWABLE  
ENERGY SECTOR IN VIETNAM**

**Major: SCIENCE AND TECHNOLOGY MANAGEMENT**

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## INTRODUCTION

### 1. The necessity of the thesis

The role of stakeholder engagement in the science, technology and innovation (STI) policy-making process in the field of renewable energy (RE) in improving the quality of policies has been confirmed in theory and practice due to the peculiarities of STI activities and policies in RE.

However, according to the official assessments of the Party, the State and in research reports, in Vietnam, the lack of coordination of the stakeholders in the formulation and implementation of STI policies leads to failures in the implementation of policy decisions, limiting the effectiveness of policies and causing failures in policy orientation. In order to overcome these limitations, the studies have been proposing that the policies should be based on practice and the participation of all stakeholders in policy development, implementation and evaluation to support the policy-making community.

The limitations on the stakeholders' engagement in the policy-making process not only exist in Vietnam, but also exist in many other countries around the world (OECD, 2014). In recent years, in the context of many unforeseen fluctuations in the world, STI policy researchers are increasingly interested in new paradigm in STI policy development in order to respond to rapid and unforeseen changes and active participation. The active and broad participation of stakeholders is a prominent feature of this paradigm. The new paradigm is called the Transformative Innovation Policy (TIP).

In such a context, the study on the stakeholders' participation in the STI policy-making process in the RE from TIP paradigm, which focuses on assessing the relationship and the impact of enterprises- stakeholder's participation playing a central role in STI activities on the results of each stage in the policy-making process is very necessary to propose solutions to improve the influence of stakeholder in the STI policy-making process to improve the quality of policies.

### 2. Research objectives

To evaluate the participation of the stakeholders in the STI policy-making process in RE sector from TIP paradigm through the assessment of the relationship and the influence of enterprises- the stakeholder playing a central role in the innovation system on the output results of each stage in the STI policy-making process.

### 3. Research subject and research scope

#### 3.1. Research subject

The relationship and influence between the participation of the enterprises in the policy-making process on the output results of each stage in the STI policy-making process.

#### 3.2. Research scope

- Subject scope: Enterprises manufacturing renewable energy equipment, producing renewable energy and providing renewable energy services.
- Content scope: Relationship and influence of enterprise participation on the output results of each stage in the policy process from TIP paradigm.
- Space scope: Solar and wind energy in Vietnam.

- Time scope: Period from 2018 to now.

#### 4. Research questions

- What aspects should be based on to evaluate the relationship and influence of stakeholders' participation on the results of the stages in the STI policy-making process from TIP paradigm ?
- What is the current situation of the relationship and the influence of the participation of enterprises on the results of the stages in the STI policy-making process in the RE sector in Vietnam?
- What are the solutions to strengthen the influence of enterprises on the results of the STI policy-making process in the RE sector in Vietnam?

#### 5. New contributions of the thesis

**-Academic, theoretical contributions:** The thesis contributes to the transformative innovation policy research in Vietnam when building a theoretical basis for determining the influencing aspects of stakeholder participation on the output of each stage in the policy-making process according to the transformational innovation policy (TIP) paradigm. While previous traditional approaches have mainly focused on the outputs of policymaking process of economic growth and competitiveness, this study has identified outputs under the TIP that need to address both environmental and social aspects to guide policies to address major challenges in sustainable development. Accordingly, the participation of stakeholders affects the identification, promulgation, implementation, and evaluation: (1) policy objectives to promote science, technology and innovation to solve social, environmental and economic challenges; (2) diverse, interdisciplinary and cross-sectoral policy solutions to solve major social and environmental challenges.

**- Practical contributions:** On the basis of the analysis of the current situation of the relationship and the impact of the enterprises' participation as stakeholder playing a central role in the innovation system to the outputs of each stage in the policy-making process within the renewable energy sector in Vietnam according to the TIP paradigm, the thesis recommends that the State should pay special attention to solutions to create motivation and pressure for enterprises to carry out scientific and technological activities for sustainable development, thereby increasing the participation of enterprises in the formulation, criticism and supervision of the implementation of laws, mechanisms and policies of the State.

#### 6. Structure of the Thesis

In addition to the Introduction, Conclusion, List of references and Appendix, the structure of the thesis consists of the following 5 chapters:

**Chapter 1:** An overview of the research on the stakeholders' participation in STI policy-making process in RE sector from TIP paradigm

**Chapter 2:** Theoretical basis of the influence of the stakeholders' participation on the results of the STI policy-making process in RE sector from TIP paradigm

**Chapter 3** Research methodology

**Chapter 4** Research results and discussion

**Chapter 5** Recommendations to enhance the influence of enterprises on the results of the STI policy-making process in the RE sector in Vietnam.

## **CHAPTER 1**

### **AN OVERVIEW OF THE RESEARCH ON THE STAKEHOLDERS' PARTICIPATION IN STI POLICY-MAKING PROCESS IN RE SECTOR FROM TIP PARADIGM**

#### **1.1. Study on the role of stakeholders' participation in the STI policy-making process in RE sector**

Studies on the role of stakeholders' participation in the STI policy-making process in the following aspects:

The role of experts and stakeholders in the initial stage of the innovation policy.

The role of stakeholders in mitigating the consequences of inequality and injustice to society caused in the energy transition.

The role of stakeholders in building and strengthening dialogue and cooperation through interoperability and willingness to maintain relationships.

Limited in the role of stakeholders in the field of climate and energy when the participation is mainly "expert" stakeholder.

#### **1.2. Study on the relationship and influence of participation on the output of the STI policy-making process in the RE sector**

The study of the relationship and influence of participation on the outcomes of the policy-making process was conducted in different countries with different research scales such as regional, national or local strategy or project.

To evaluate the relationship and influence of participation on the outcomes policy-making process, studies have used different evaluation methods such as evaluating the participatory process and the outcomes of citizen participation (Falanga et al.), the approach to the role of enterprises in the political system and the socio-political economy (Starkman, 2018), the stakeholder participatory approach (Jekabsone et al., 2019).

The results of studies on the stakeholders' participation in policy-making process in RE in some countries show that although the participation of stakeholders plays an important role, in practice it still does not meet expectations (Galende-Sánchez & Sorman, 2021).

For more effective participation of stakeholders, studies recommend a number of solutions such as the state promulgating regulations on the form of participation (Chwalisz, 2019; Elstub, 2019); strengthening coordination between the government and implementing agencies (Weber & Rohrer, 2012), between different government agencies (Peng & Bai, 2018; Seong et al., 2016), between different policies (Crespi, 2016; Scordato et al., 2018); focusing on processes with more impact, prioritizing the organization of high-impact, participatory and well-prepared policy processes (OECD, 2023).

Studies have also shown that some of the conditions that ensure effective participation of stakeholders are: (i) The stakeholders participation should be based on the principle of respect and relative equality (Bachtiger et al., 2018), the principle of trust, and facilitating the building of positive networks among participants (Kalkbrenner & Roosen, 2016; Byrne et al., 2017); (ii) policy processes need to commit to transparency to ensure openness, clarity, and traceability (Ernst et al., 2017).

### **1.3. Study on new policy trends to overcome limitations on the stakeholders' participation in the STI policy-making process**

Since 2018, especially after the COVID-19 pandemic, researchers have been interested in researching new policy trends to promote STI to find comprehensive solutions to address major challenges of sustainable development, which requires the participation of more people including international organizations and responsible citizens (Kattel & Mazzucato, 2018; Kuhlmann & Rip, 2018; Schot & Steinmueller, 2018; Grillitsch et al., 2019; Diercks et al., 2019) and stakeholders have increased their influence over the policy-making process. The policy trend is called "transformative innovation policy framework/paradigm" (Kattel & Mazzucato, 2018; Diercks et al., 2019; Fagerberg, 2018; Giuliani, 2018; Kuhlmann & Rip, 2018; Schot & Steinmueller, 2018; Soete, 2019). Through a comparison between the characteristics of the stakeholders' participation from TIP paradigm and the two pre-existing policy models, the S&T policy for growth and the innovation system policy, the studies have shown the advantages of the TIP paradigm in 06 aspects such as *innovation models, policy objectives, rationales for state intervention, policy tools, stakeholders in the innovation model, and policy governance* (Schot & Steinmueller, 2018; Edler & Fagerberg, 2017; Boon & Edler, 2018; Borrás & Laatsit, 2019).

In the TIP paradigm, the stakeholders' participation plays an important role in building an innovation model to promote sustainable transformation based on social, institutional, infrastructure and market factors; encourage deeper learning methods, helping to develop and connect common goals among many stakeholder; addressing failures that hinder S&T policy addressing the major challenges that the previous two generations of policies have not solved are *directionality failures, coordination failures, demand articulation failures and reflexivity failures* (Weber and Rohracher, 2012).

In Vietnam, the report of the World Bank and the Ministry of Science and Technology (2020) proposes that Vietnam needs to develop an innovation policy that mobilizes greater participation and interaction of all stakeholders in policy development, implementation, and evaluation. In addition, there are also a number of studies on the need to research and develop a new STI policy paradigm in Vietnam (Bach Tan Sinh, 2020, 2021) in the context of increasing unpredictable fluctuations in the future.

### **1.4. General assessment of the research related to the thesis topic**

Studies on the participation of stakeholders in the STI policy-making process in RE in some countries around the world with many different contents.

At the same time, the studies also show that, in the context of the requirements of the sustainable development and energy transition set for the STI policies, it is necessary to have an approach to the stakeholders' participation in the STI policy-making process that has just been inherited from existing policy models and shifted to the TIP paradigm at the same time.

### **1.5. Research gaps**

- The studies used different research methods to evaluate the relationship and the influence of the stakeholders on the results of the policy-making process in different countries, but there were no studies evaluating the relationship and the influence of

the stakeholders on the results of the STI policy-making process in RE from TIP paradigm in Vietnam.

- TIP paradigm with superior characteristics, suitable for fields with socio-technical transformation such as the field of RE.

- In Viet Nam the development of RE plays an important role in the implementation of commitments on sustainable development.

- The transition to renewable energy has a far-reaching impact, directly affecting the economy, environment, health, social security, and national energy security. The energy transition process involves different policies and involves many different subjects such as ministries, sectors, businesses, and international organizations.

- In fact, the policy-making process is still basically internal between state agencies, parties affected by the policy of limited participation in supervision and policy development.

Therefore, the evaluation of the relationship and influence of stakeholders on the results of the policy-making process in RE from TIP paradigm is a gap that needs to be studied.

- Studies have been conducted on the influence of different stakeholders, especially those of citizens, on the outcome of the policy-making process. In the context of Vietnam, the 10-year socio-economic development strategy 2021-2030, Resolution No. 41-NQ/TW dated October 10, 2023 of the Politburo on building and promoting the role of Vietnamese entrepreneurs, the Strategy for the development of STI to 2030 affirms the role of enterprises in sustainable development based on STI. At the same time, they pointed out the limitations of enterprises in terms of competitiveness, a number of mechanisms and policies to encourage and support enterprises are slow to be implemented, the efficiency is not high, and emphasized that the causes of the above limitations and weaknesses *"are mainly due to the state management, the coordination between agencies in building and organizing the implementation of policies and laws is not tight and frequent"*. Therefore, the study of the relationship and the influence of enterprise participation on the results of the policy-making stages must be prioritized compared to other stakeholders.

- The study contributes to the development of evaluation aspects of the stakeholders' participation in the policy-making process for sustainable development. At the same time, evaluating the participation of enterprises will contribute to providing practical evidence for the TIP research community in the world to consider the suitability of the TIP paradigm in the context of a developing country with limitations in terms of financial resources, human resources, and awareness.

## **CHAPTER 2:**

### **THEORETICAL BASIS FOR THE INFLUENCE OF STAKEHOLDERS' PARTICIPATION ON THE OUTCOME OF THE STI POLICY-MAKING PROCESS FROM TIP PARADIGM**

#### **2.1. Concepts**

##### ***2.1.1. Science, technology and innovation policy***

The author uses the terms STI policy, S&T policy, and Innovation policy in the Thesis. Because these terms have similarities with each other, they are used interchangeably within the framework of the thesis.

In the thesis, STI policies are understood as "state policies to support and mobilize input and output resources for STI activities in order to maintain sustainable economic growth towards the implementation of progress, social justice and protection of the ecological environment, effectively manage and use natural resources, respond to climate change".

STI policies are affected by both external and internal factors (United Nations, 2022). Therefore, the design of STI policies cannot be limited to a single ministry or agency responsible for STI, and requires a well-coordinated policy process, which combines the process of analysis and consultation, interacting with many different industries and professional fields.

### ***2.1.2. Stakeholders in the public policy-making process***

In the world, there are different ways of defining stakeholders in the policy-making process, but they all share the same characteristic that stakeholders include those who are affected or likely to be influenced by policy decisions or are interested in policy decision-making.

Regarding the composition of stakeholders in the policy-making process, there are also different ways of division. The International Risk Governance Board distinguishes four main groups involved in the policy-making process: political, business, scientific and civil society representatives. In addition, there are other relevant groups such as the media, cultural elites and public opinion leaders and citizens (IRGC, 2013; Aven and Renn, 2010). According to Nguyen Huu Hai and Le Van Hoa (2013), the subjects involved in the public policy-making process include voters, political parties, elected agencies, administrative apparatus, interest groups, and research organizations. In addition to the above stakeholders, there are also international stakeholders participating in the policy-making process (Risse-Kappen, 1995; Coleman and Perl, 1999).

### ***2.1.3. Stakeholders in the STI policy-making process***

The stakeholders in the STI policy-making process include the state, enterprises, research and education systems, and society (intermediary organizations, consumers/users and civil society, citizens) (UNCTAD, 2019).

## **2.2. Stakeholder approach**

The stakeholder approach developed by Edward.R. Freeman (1984) has been developed and applied by many scientists and organizations around the world in the public policy-making, especially the Organization for Economic Co-operation and Development (OECD). Some of the main contents developed from the stakeholder approach include:

### ***2.2.1. Framework for analyzing stakeholders according to power and interests***

Freeman's (1984) "Power-Benefit" analytical framework has been used to manage stakeholders, win their support, and minimize opposition through identifying aspects of rights and interests.

### ***2.2.2. Influence of stakeholders' participation on public policy outcomes***

#### ***2.2.2.1. Affect the content of the policy***

The influence of stakeholders on policy content in the main aspects is policy objectives, tools/solutions.

- Regarding policy objectives: Orienting the goal of solving social challenges;



- Regarding solutions/policy tools: More appropriate options from environmental, economic, and technical perspectives; New action options, stronger solutions, better defining long-term sustainable approaches; Providing diverse and multi-dimensional information for the policymakers; Providing more ideas and initiatives for policy development.

- Improve the quality of policies, especially the social and inclusive aspects of policies.

#### **2.2.2.2. *Impact on the policy-making process***

- Contribute to improving the information quality of decision-making processes and better use of information.

- Expand the scope of policy decisions.

- Increase ideas and creativity groups.

- More dynamic policy processes, more transparent decision-making.

- Identify conflicts early and better manage or resolve conflicts.

- Increase the legitimacy of the decision-making process.

- Empower and amplify the influence of less organized interests.

- Improve people's trust in the government and authorities.

#### **2.2.3. *The level of stakeholders' participation in the public policy-making process***

The assessment of the level of stakeholders' participation in the policy-making process originated from the "scale of people's participation" in Sherry Arnstein's theory of people's participation in government building (1969) and has since been developed by researchers and international organizations in different aspects. The scale has eight "ladders" that describe three common forms of civic power in democratic decision-making: non-participation (no power), levels of symbolism (artificial power), and levels of civic power (actual power).

The level of stakeholders' participation in the policy-making process continues to be researched and developed in different fields. According to IRGC (2013), Health Canada (2000), Abelson and Gauvin (2006), OECD (2015), the participation of stakeholders' participation in the policy-making process is expressed at three levels: *Level 1*: providing information. *Level 2*: consultation. *Level 3*: active participation. The level of stakeholders' participation depends on the complexity/risk level of the policy issue to be consulted. As policy issues become more complex or the level of risk is higher, more stakeholders are required to participate in the policy-making process.

### **2.3. Procedures of the STI policy-making process**

#### **2.3.1. *Public policy formulation***

The policy-making focused on solving the following questions: (1) What are the policy issues that need to be solved?; (2) What course of action should be chosen to solve that problem?; (3) What are the results of choosing the direction of action?; (4) Does achieving these results help solve practical problems?; (5) If choose other directions of action, what will be the result?

#### **2.3.2. *Public policy-making process***

In the world, there are many ways to divide the policy-making process (including 05, 07 or 08 stages). In Vietnam, the public policy-making process consists of 04 stages (Agenda settings, Policy formulation and promulgation,

Policy implementation, Policy evaluation).

### **2.3.3. STI policy-making process**

The thesis use on an adjusted basis to suit the views of 3 organizations: (i) Centers for Disease Control and Prevention (2019) of the United States; (ii) United Nations Intersectoral Working Group on STI for the Sustainable Development Goals (2020); and (iii) Harvard Kennedy School's Smart Policy Design and Implementation Initiative (2022), whereby, there are 04 stages in the STI policy process, including: Phase 1: Agenda Settings; Phase 2: Policy formulation and promulgation; Phase 3: Policy implementation; Phase 4: Policy evaluation.

### **2.3.4. Contents of stakeholders' participation in the STI policy-making process**

According to the OECD (2023), stakeholders participate in the following contents in the policy-making process:

- Participate in the process of identifying short-term and long-term priorities for policy and financing for STI.
- Participate in the identification of priorities for R&D programmes and the allocation of funds according to priority areas.
- Evaluate technologies to identify the social, economic, and ethical risks of the application of emerging technologies.
- Strategic forecasting to develop common visions for the future and act together, mobilizing resources to achieve common goals.
- Supporting the spread of technology towards achieving economic and social goals.

In order to mobilize the best participation of stakeholders in the policy-making process, it is necessary to develop a plan to mobilize the stakeholders to participate, design optimal methods of mobilizing participation, ensure to meet the expectations of stakeholders and notify them of the results, build a process to integrate the results from the stakeholders participation into the policy-making process.

Although stakeholders can participate in all stages of the policy process, for each stage, it is necessary to prioritize the participation of different stakeholders. According to the OECD (2023), for the citizens, it should be prioritized to mobilize their participation in the following cases: (i) Choosing to decide on long-term policy directions among the many options that require social verification; (ii) Policies that require public knowledge in the process of policy development and implementation; (iii) Policy topics that people are particularly interested in and can create "winners" and "losers" and when trust in state institutions is in danger of being lost.

## **2.4. Transformative innovation policy paradigm**

### **2.4.1. Concept of transformative innovation policy paradigm**

The TIP paradigm is a collection of perspectives that consider STI at the system level, in which STI is governed by social and environmental objectives, based on practical experience, learning, interaction, and willingness to review current regulations to solve social challenges (Schot and Steinmueller, 2018).

The TIP paradigm is built on the basis of inheriting and developing two existing STI policy models in the world and does not completely replace the previous models.

The TIP paradigm is based on the theory of sustainable transitions. This model considers environmental and social challenges as a central component of STI

policies and requires the orientation of STI activities towards fundamental changes in socio-technical systems to meet the basic needs of life (Schot, 2018).

#### ***2.4.2. Characteristics of the TIP paradigm***

- **Innovation model:** The TIP paradigm pursues an innovation model that promotes sustainable transformation, and R&D and non R&D based innovation are both the object of the policy.

- **Policy goal orientation:** Policies not only promote the speed of innovation but also orient innovation to support the sustainable transition to solve major challenges in society, environment, energy, health, education, and employment,... and thereby promote economic growth.

- **Reasons for state intervention:** The state intervenes in policies to solve failures that hinder STI from solving major challenges including directionality failures, coordination failures, demand articulation failures and reflexivity failures.

- **Involvement of stakeholders in the innovation system:** This model emphasizes the need for the involvement of more stakeholders in order to find comprehensive, technical evidence-based solutions that meet the real needs of different social groups to address environmental challenges, society not only on a national level but also on a regional and global scale (Diercks et al., 2019; Steward, 2012). In addition to the role of the government, research and training organizations, scientists, businesses, support organizations, and socio-professional organizations, it is very necessary to have the role of international organizations and responsible citizens.

- **Policy instruments:** The TIP model emphasizes the need for a more diverse and complex set of policy instrument to address major challenges such as policy mix (Bugge et al., 2018), combining supply-side and demand-side policies (Diercks et al., 2019; Rogge and Reichardt, 2016; Schot and Steinmueller, 2018; Steward, 2012), support experimental policies (Kivimaa and Kern, 2016).

- **Policy governance:** Major challenges are closely interconnected, requiring broader and more comprehensive thinking in policy formulation to solve challenges. Therefore, there needs to be better policy coordination due to the emergence of many stakeholders; promote experimentation, flexibility, feedback, and learning in the policy process to respond to rapid and unpredictable changes.

#### ***2.4.3. Results of stages in policy-making process from TIP paradigm***

From the above analysis, the differences between policy generations are the policy objectives and policy solutions/instruments. Therefore, the author believe that the results of the policy process according to the TIP model need to be considered in 02 aspects: (1) policy options with the goal of promoting innovation to solve major challenges in society, environment, energy, health, education, jobs... and will lead to economic growth; (2) policy plans include diverse and interdisciplinary policy solutions/instruments to solve major social and environmental challenges, allowing policy experiments.

The results of the policy-making process are achieved on the basis of the results of the stages throughout the policy process. On the basis of the above 02 aspects, the author continues to propose aspects to determine the results of the stages in the policy process according to the TIP model as shown in the figure below.

### **2.5. International experience in strengthening the influence of the stakeholders' participation on the outcome of the policy-making process**

### ***2.5.1. Forms of mobilization of stakeholders' participation***

- Mobilize citizens' participation: encourage the sharing of ideas for research and innovation programs, surveys, polls on research issues, organize exchanges, seminars to develop future scenarios, mobilize participation in scientific and technological programs, organizing awards on innovation, building online cooperation platforms, building living laboratories...

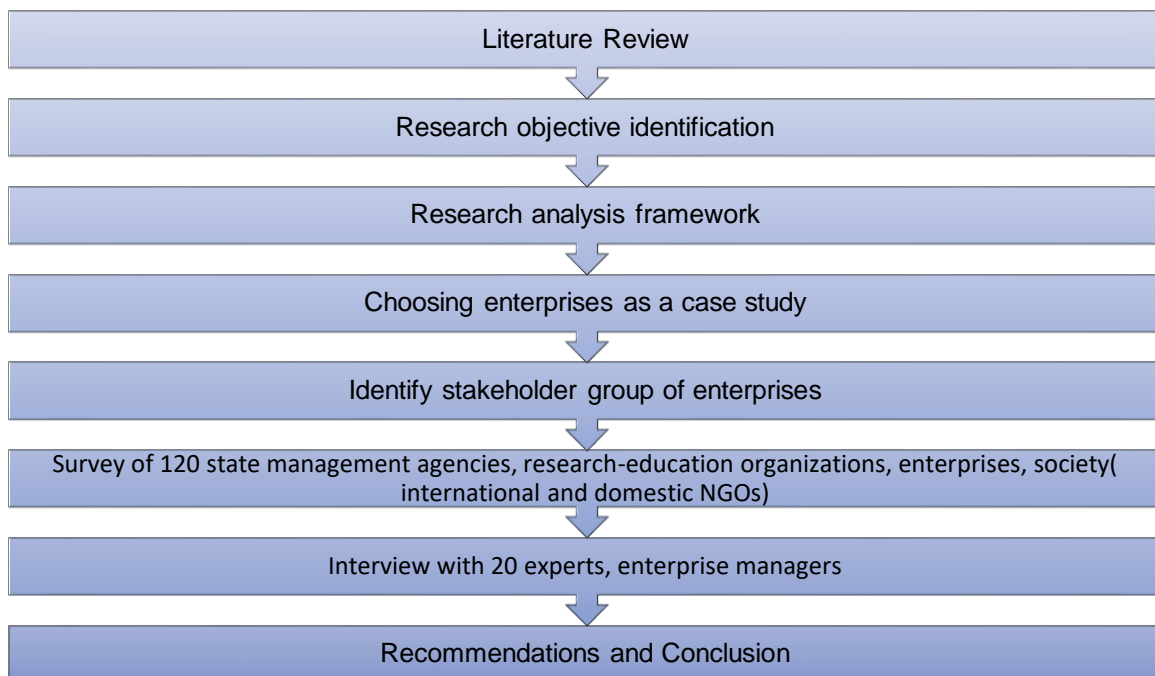
- Mobilize international participation: coordinate in formulating mechanisms and policies; develop common programs on research and application of technological solutions; develop policy initiatives, etc.

### ***2.5.2. Design and implement the process with the participation of Stakeholders***

- Define the goals and scope of participation
- Target citizens and ensure inclusive participation.
- Design and implement comprehensive citizen engagement processes.

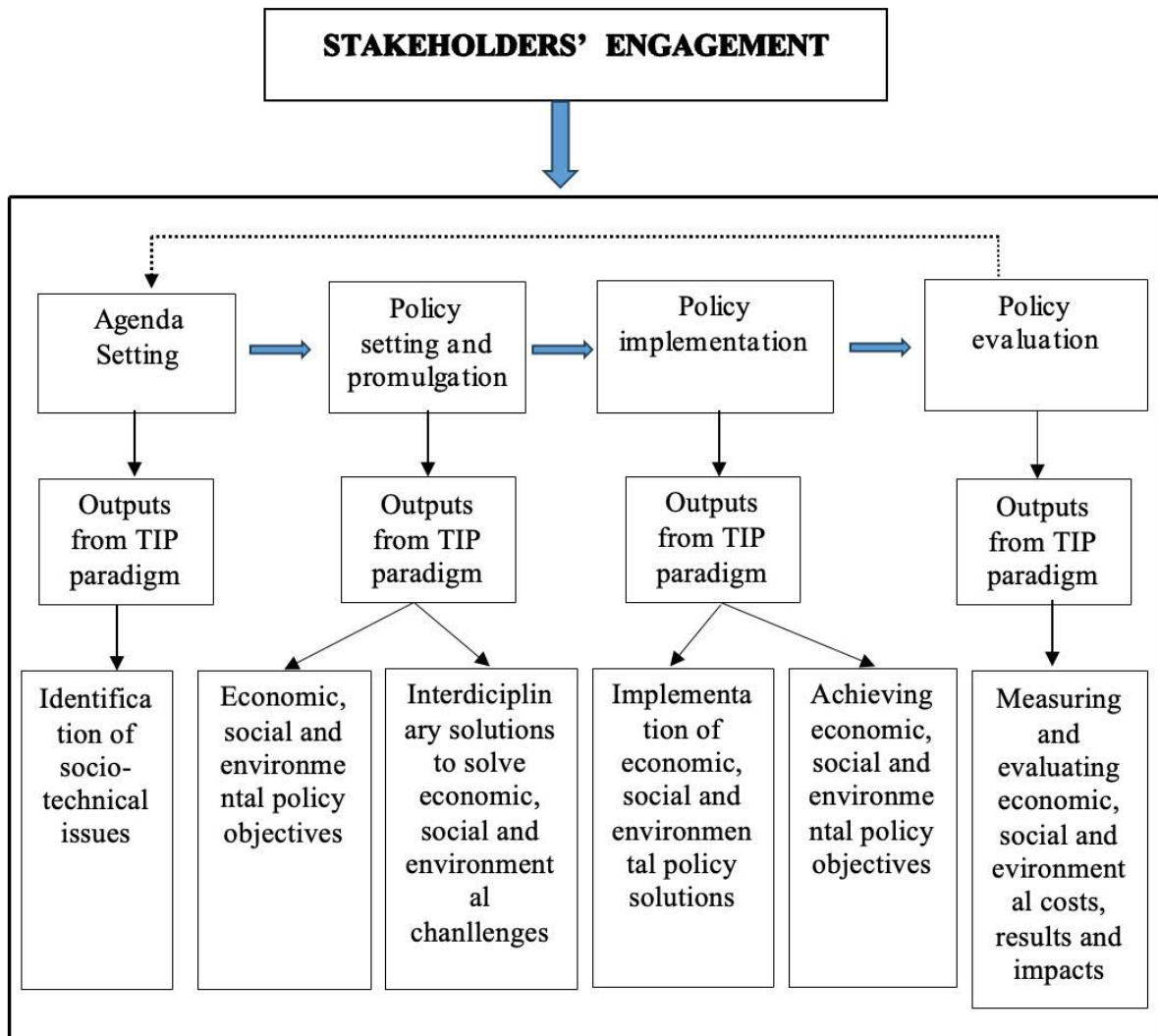
## **CHAPTER 3 RESEARCH METHODOLOGY**

### **3.1. Research process**



### **3.2. Analytical framework and research hypothesis**

#### ***3.2.1. Research analysis framework***



### 3.2.2. Research hypothesis

**H1:** In order to assess the impact of enterprise participation on the output results of each stage in the policy process according to the transformational innovation policy model, it is necessary to base on the following aspects: (1) Influence on policy objectives to promote planning, Addressing social, environmental and economic challenges; (2) Affecting diverse and interdisciplinary policy solutions to solve major social and environmental challenges.

**H2:** Enterprises positively affect the results of the stages in the STI policy process for the sustainable development in the field of renewable energy in Vietnam.

**H3:** In order to strengthen the relationship and influence of enterprises on the output of the STI policy process for the sustainable development in Vietnam, special attention should be paid to groups of solutions to increase the interests and power of the stakeholders.

## 3.3. Criteria for assessing the impact of the stakeholders' participation on the results of the stages in the policy from TIP paradigm

### 3.3.1. Classification of influence

The degree of influence of the stakeholders' participation on the output of the policy process includes 03 levels: Low, Medium, High, in which:

**Low level:** Stakeholders receive or provide one-way information from/to state agencies through direct or indirect channels.

**Medium level:** The stakeholders has a two-way dialogue with state agencies during the policy process, expressing their views, desires and aspirations for the competent decision-making agency to consider and consider before making a decision.

**High level:** Stakeholders participate in organizations established by the policymaking agencies to jointly make policy decisions.

### 3.3.2. Specific criteria to assess the impact of stakeholders on the results of the stages in the policy process

**Table 3.1: Influence of stakeholders on the results of the agenda setting stage**

Low	Medium	High
<ul style="list-style-type: none"> <li>- The stakeholders receives or provides one-sided information on the existences, difficulties, challenges and causes in the process of implementing STI activities and the implementation of STI policies from an economic, social and environmental perspective from/to the State policy-making agencies.</li> <li>- The opinion of the stakeholders is not reflected in the policy promulgation plan.</li> </ul>	<ul style="list-style-type: none"> <li>- The stakeholders participate in a two-way dialogue with the State policy-making agencies to identify the existences, difficulties, challenges and causes in the process of implementing STI activities and implementing STI policies from economic, social and environmental perspectives</li> <li>- The opinions of the stakeholders are considered and expressed in the policy promulgation plan.</li> </ul>	<ul style="list-style-type: none"> <li>- The stakeholders participates in organizations established by the State policy-making agencies to identify existences, difficulties, challenges and causes in the process of implementing STI activities and implementing STI policies from economic, social and environmental perspectives</li> <li>- The opinion of the stakeholders is expressed in the policy promulgation plan.</li> </ul>

- During the policy formulation and promulgation phase

**Table 3.2: Influence of Stakeholders on the results of the formulation and promulgation stage**

Low		Medium		High	
Impact on policy goals	Impact on policy instruments	Impact on policy goals	Impact on policy instruments	Impact on policy goals	Impact on policy instruments
<ul style="list-style-type: none"> <li>- Receive or provide one-way information about policy objectives from/to State policy-making agencies.</li> <li>- Stakeholders' opinion is not reflected in the policy content.</li> </ul>	<ul style="list-style-type: none"> <li>- Receive or provide one-way information from/to State policy-making agencies about plans to develop policy instrument.</li> <li>- Stakeholders' opinion is</li> </ul>	<ul style="list-style-type: none"> <li>- Participate in two-way dialogue with the State policy-making agencies to determine economic, social and environmental policy objectives</li> <li>- The opinions of</li> </ul>	<ul style="list-style-type: none"> <li>- Participate in two-way dialogues with the State policy-making agencies on diverse policy solutions both inside and outside the STI scope.</li> <li>- The opinions of the</li> </ul>	<ul style="list-style-type: none"> <li>- Participate in organizations established by the State policy-making agencies to determine economic, social and environmental policy objectives</li> <li>- The opinions of the stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>- Participate in organizations selected and determined by the State policy-making agencies diverse policy solutions both inside and outside the scope of the field of science,</li> </ul>

	not reflected in the policy content.	the stakeholders are considered and expressed in the policy content.	stakeholders are considered and expressed in the policy content.	are expressed in the policy content.	technology and innovation - The opinions of the stakeholders are expressed in the policy content .
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- During the policy implementation period:

**Table 3.3: Impact of stakeholders on the results of the policy implementation stage**

Low		Medium		High
Impact on policy goals	Impact on policy instruments	Impact on policy goals	Impact on policy instruments	
- Receive or provide one-sided information on the formulation and implementation of plans to implement policy objectives from/to the State policy-making agencies. - The opinion of the stakeholders on the implementation of policy objectives is not reflected in the implementation plan and policy implementation practice.	- Receive or provide one-way information about the plan to implement policy instruments from/to State policy-making agencies. - The opinion of the stakeholders on the implementation of policy instruments is not reflected in the implementation plan and practice of policy implementation.	- Participate in two-way dialogue with the State policy-making agencies in developing and implementing plans for the implementation of policy objectives. - The opinions of the stakeholders are considered and expressed in the implementation plan and the practice of implementing policy objectives.	- Participate in two-way dialogue in the development and implementation of plans for the implementation of policy instruments. - The opinions of the stakeholders are considered and expressed in the implementation plan and the practice of implementing policy tools.	- Participate in organizations established by the State policy-making agencies in the process of policy implementation to supervise the implementation of the policy. - The opinions of the stakeholders are expressed in the development and implementation of plans for the implementation of policy objectives

- During the policy evaluation period:

**Table 3.4: Impact of Stakeholders on the results of the policy evaluation stage**

Low	Medium	High
- Receive or provide one-sided information about the benefits, economic, social and environmental costs of the policy from/to the State policy-making	- Participate in a two-way dialogue with the State policy-making agencies on measuring and evaluating the economic, social and environmental benefits	- Participate in organizations established by the State policy-making agencies to measure the economic, social and environmental benefits and

agencies. - The opinion of the stakeholders on the economic, social and environmental benefits and costs of the policy is not reflected in the policy evaluation.	and costs of the policy. - The opinion of the stakeholders on the economic, social and environmental benefits and costs of the policy is considered and expressed in the policy evaluation.	costs of policies - The opinion of the stakeholders on the economic, social and environmental benefits and costs of the policy is reflected in the results of the policy evaluation.
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### **3.4. Research methods and techniques**

#### **3.4.1. Dialectical and historical research methods**

Dialectical and historical research methods are applied to study the relationship of mutual impact, associated with the implementation of the objectives of strengthening the role and influence of stakeholders in the formulation, criticism and supervision of the implementation of STI mechanisms and policies, for sustainable development in the relationship of the impact of factors on legal regulations on the participation of stakeholders in the policy process, on the factors affecting the participation of civil servants, on the context and trends of domestic RE development, international and requirements for STI policies. The thesis uses the theory of change to explain how specific activities that create change contribute to the final projected impact outcome (World Bank, 2011; Roger 2014). The theory of change can be modeled in a variety of ways, for example, using theoretical models, logical frameworks that evaluate according to outputs, and expressed as follows: Input->Output->Outcome-> Impact.

#### **3.4.2. Methods and techniques of data collection and processing**

##### *3.4.2.1. Secondary literature research*

Secondary literature research is applied to develop criteria for evaluating the impact of the stakeholder's participation and a preliminary assessment of the relationship and influence of their participation on the results of the policy stages from TIP paradigm.

##### *3.4.2.2. Primary data collection through interviews*

In-depth interviews with a number of experts to learn about the form of participation, the extent of their influence on the results of each STI policy stage from TIP paradigm and the factors affecting their participation.

##### *3.4.2.3. Data collection through questionnaire survey*

###### *a) Survey subjects and contents*

Some enterprises manufacture RE equipment, produce RE and provide RE services; a number of business associations; a number of agencies assigned to perform the function of state management of RE and STI; research and education agencies in RE sector; foreign and domestic non-governmental organizations.

###### *b) Survey objectives*

In order to learn about the stages of stakeholders' participation in policy process, the form of participation, the content of participation, the results of participation, the factors affecting the participation and the influence extent of the stakeholders' participation and their recommendations.

###### *c) Sampling method*



The sample is selected according to the stratified random sample selection method, according to 2018 Law on Promulgation of Legal Documents, Electricity Law and the Law on Science and Technology.

The questionnaire consists of 03 parts (Part I: General information about the respondents; Part II: Opinions on participation in the STI policy process in RE sector; Part III: Recommendations).

The specific steps to implement and complete the survey are as follows: ***Step 1. Complete the survey form; Step 2. Trial survey; Step 3. Complete the survey form ; Step 4. Official Survey***

The total number of questionnaires sent is 120. The number of respondents was 60, of which 48 samples were collected through the Google form tool, 14 samples were collected by post.

### ***3.4.3. Data Analysis***

- Qualitative data analysis on the basis of a collection of outstanding main ideas through interviews, recorded, synthesized and analyzed in the main report of the thesis.

- Quantitative analysis on the basis of secondary data and survey of the thesis will use common analysis techniques such as descriptive statistics, comparative statistics to give a picture of the stages of stakeholders' participation in the policy process, the form, contents, results of participation, factors affecting participation and the extent of stakeholders' participation influence. This technique will be combined with the use of tables, figures,...

## **CHAPTER 4 RESEARCH RESULTS AND DISCUSSION**

### **4.1. Overview of the development of the renewable energy sector in Vietnam**

#### ***4.1.1. Trend of shifting to renewable energy***

In order to meet the goal of limiting the increase in global average temperature and in the face of the fact that the global average temperature has increased, the global energy transition is tending to accelerate rapidly in the past period thanks to a series of strong oriented policies of countries. The transition to renewable energy is a trend in countries to mitigate the impacts of climate change, creating a more environmentally friendly and equitable world for all.

#### ***4.1.2. Development of the renewable energy sector in Vietnam***

Vietnam is considered a country with a lot of potential for RE development and Vietnam's RE is developing rapidly. According to the National Electricity Development Plan, Vietnam needs to achieve a RE rate of 15-20% by 2030 and 20-30% by 2045. In order to realize the RE development strategy, over the past time, Vietnam has prioritized investment and use of RE in the development of the energy sector, and at the same time encouraged organizations and individuals to participate in the RE development and use. However, recent practice shows that there are still many difficulties and inadequacies in the development of RE sources, including difficulties in STI.

## **4.2. The process of improving the regulations on the stakeholders' participation in STI policy process**

- **Regarding regulations on the stakeholders' subjects:** Stakeholders in the STI process in RE sector can be divided into 04 groups according to the quadruple innovation helix including the State - Research and Training Organizations-Enterprises - Society.

- **Regarding regulations on the powers and responsibilities of stakeholders:** There are 02 significant changes:

+ In addition to regulations on the role of two ministries managing STI in the field of RE, namely the Ministry of Industry and Trade and the Ministry of Science and Technology, the law has clearly stated the role and coordination of a number of other ministries and sectors in formulating and promulgating according to their competence or submitting them to competent agencies for promulgation and organizing the implementation of normative documents laws, mechanisms, policies, strategies, plans and measures to promote scientific and technological development and technological innovation; building and managing a system of databases, information and statistics on S&T.

+ Policy-making agencies are required to collect opinions from stakeholders on the legal document's draft and are responsible for studying comments to absorb and adjust the draft document.

- Organizations and individuals may be mobilized to participate in the process of making proposals for the formulation of the legal documents and the process of legal document's drafting, including: research institutes, universities, associations, other relevant organizations, experts and scientists.

- Documents to be consulted are the dossier of proposal for the formulation of the legal document, the summary report, the report on the assessment of the impact of the policy in the proposal for the formulation of the legal document, the legal document draft.

- The policy-making agencies provide information to the stakeholders, consult and attract the stakeholders to participate through various forms.

- Regulations are still administrative in nature when they have not been promulgated together with supervision and encouragement mechanisms.

## **4.3. Practice of enterprises participation in STI policy process in RE sector in Vietnam**

### ***4.3.1. Analysis of the role of enterprise participation according to the Benefit-Power analysis framework***

STI activities are not associated with the interests of many enterprises, so they play a limited role in creating motivation for enterprises to participate in the STI policy process. However, enterprises have a great influence on the achievement of goals and the implementation of tasks and solutions set out in the state's STI policies in the field of renewable energy in Vietnam. From the analysis of 02 factors of interests and power of enterprises, it can be classified that Vietnamese renewable

energy enterprises are currently in the group with great power and influence on policies but have few benefits and motivation when participating in the policy process. According to Freeman's stakeholders approach, this group of businesses is a group **to pay attention to**.

In order for enterprises to become the center of STI policies, or become a group of subjects according to the stakeholders approach, it is important to design a mechanism so that the policy directly affects the interests of enterprises and enterprises are required to comply.

**The policy implications in the analysis of the participation of enterprises in the STI policy process in RE sector are as follows:**

- The core solution for enterprises to consider STI as a breakthrough in development and participate in the policy process is to closely associate policies with the interests of enterprises, and at the same time must have a binding mechanism.

- The policy-making agencies need to consider the development of mechanisms to support enterprises to carry out STI activities as a solution that contributes to attracting the participation of enterprises in the policy process.

- The participation of enterprises in the STI policy process plays a central role in connecting the participation of other organizations because enterprises play a central role in the innovation system.

- STI policies play an important role in improving the competitiveness of enterprises and require the active participation of enterprises (as objects affected by policies) in all stages of the policy process so that the policies meet the real requirements and aspirations of enterprises.

#### ***4.3.2. Influence of enterprises' participation on the results of Agenda setting stage***

Enterprises have a **high level of influence** in identifying policy issues from an economic perspective; enterprises have a moderate level of influence in identifying policy issues from a social and environmental perspective.

**The policy implications of the assessment results affecting the participation of enterprises in the Agenda setting stage are as follows:**

- The participation of enterprises right from the early stage of the policy process is a premise and favorable conditions for developing evidence-based objectives and policy solutions and is a difference compared to the law when the stakeholders are only mobilized by policy-making agencies at the stage before promulgating policies.

- The participation of the enterprise in the policy initiation stage proves that the enterprise has interests or is "seeking" benefits in this field. The policy-making agencies need to consider this as an opportunity, but also a challenge and need to develop a plan to attract the participation of the business community in the policy process.

- STI is a tool for businesses to achieve growth goals in revenue and profit, so businesses often do not pay much attention to difficulties from a social and environmental perspective. This is the reason why in the later stages of the policy

process, the level of impact of enterprises in participating in the development and implementation of social and environmental goals and solutions is only average.

- The STI policy-making agencies put enterprises at the center and make more and more efforts to mobilize the participation of enterprises in the policy process. However, understanding the characteristics and strengths of each type of business is necessary to develop a plan to mobilize the participation of enterprises such as the form of participation and the level of participation in the policy process effectively.

#### ***4.3.3. Influence of enterprises on the results of the Policy formulation and promulgation stage***

Enterprises have a **Medium level** of influence in determining policy objectives and solutions.

**The policy implications of the assessment results affecting the participation of enterprises in the policy formulation and promulgation stage are as follows:**

- Because enterprises are not yet interested in participating in the formulation and promulgation of STI policies to achieve environmental and social goals, policy-making agencies need to seek other inputs and proactively create in-depth discussion topics on the environment, society to attract the attention of businesses or other forms of attracting participation.

- This is an important stage that determines the participation of enterprises in the next stages of the policy process. In addition to the benefit factor of enterprises, transparency and trust in the Government affect the participation of enterprises in the policy process.

- The State needs to promulgate specific and appropriate incentive mechanisms to encourage enterprises to apply STI for environmental and social objectives.

- Enterprises in the RE sector participating in the stage of policy formulation and promulgation are a positive signal, proving that the difficulties, challenges and aspirations of enterprises are being listened to by the policy-making agencies, gradually institutionalized in legal documents and so in the later stages of the policy process, it will attract the participation of more enterprises.

#### ***4.3.4. Influence of enterprises on the results of the policy implementation stage***

Enterprises are affected at **an Medium level** during the policy implementation stage. However, enterprises are only really interested in STI when the following factors are satisfied at the same time. They are the benefits achieved from STI activities, STI capacity, resources for STI and the innovation system to support the efficiency of STI activities of enterprises. Currently, these are still weaknesses of Vietnam and therefore limit the participation of businesses in the implementation of STI policies in this field.

**The policy implications of the assessment results affecting the participation of enterprises in the policy implementation stage are as follows:**

- The level of participation of enterprises in the policy implementation stage is a consequence of their interest in STI activities and STI policies, of their trust in the transparency of policies and the Government.

- Creating a healthy competitive environment for enterprises to improve their competitiveness based on STI, policies to encourage and create favorable conditions to attract investment resources for technology, strengthen business links with research institutes and universities are important factors to promote enterprises' interest in STI activities and implementation of science and technology policies.

#### ***4.3.5. Influence of enterprises on the results of the Policy Evaluation stage***

The participation of enterprises in the policy evaluation stage has similarities with the Agenda setting stage, however, as in the previous stage of the policy process, the evaluation of the enterprise is from a micro perspective and it is necessary to combine the evaluation of other stakeholders to provide a comprehensive assessment based on scientific arguments for the policy-making agencies. The level of influence of businesses in this period is Medium.

The results of Chapter 4 show that the relationship between the participation of enterprises and the results of the stages in the policy process has a favorable relationship. Enterprises have a higher influence in identifying, promulgating, implementing and evaluating objectives and solutions of STI policies in order to achieve the goals of reducing costs, increasing profits and improving the competitiveness of enterprises and have a lower influence in determining, promulgating, implementing and evaluating objectives and solutions of STI policies in order to implement the objectives and solutions to achieve the goals of creating sustainable jobs, providing sustainable energy to people in disadvantaged areas, mobilizing the participation of local communities in enterprises' STI initiatives...

## **CHAPTER 5**

### **RECOMMENDATIONS TO INCREASE THE INFLUENCE OF ENTERPRISES ON THE RESULTS OF THE STI POLICY PROCESS IN RENEWABLE ENERGY SECTOR IN VIETNAM**

#### **5.1. International and domestic contexts and issues posed to the participation of enterprises in the STI policy process**

##### ***5.1.1. International context***

Climate change, complicated natural disasters, global warming, sea level rise, pollution, and environmental degradation continue to pose many challenges for sustainable energy development. The context of international energy development has a great impact on Vietnam's energy development in the coming period, especially the country's energy transition towards achieving the goal of carbon neutrality by 2050.

##### ***5.1.2. Domestic context***

###### ***5.1.2.1. Progress of implementation of environmental protection objectives***

In Viet Nam, the Party and the State are strongly committed to implementing the United Nations 2030 Agenda for Sustainable Development based on the National Action Plan for the implementation of the 2030 Agenda for Sustainable Development with the core motto "leaving no one behind". However, there are still difficulties and

challenges posed in the implementation of sustainable development goals in Vietnam, requiring Vietnam to develop and improve policies not only to promote STI but also to orient the development of STI to serve the development of RE.

#### *5.1.2.2. Bottlenecks of RE development and STI policies in the RE sector*

Vietnam's RE development is facing 3 major bottlenecks: (i) Mechanisms and policies; (ii) Techniques; (iii) Capital for renewable energy projects. The institutional system for RE development is quite primitive without many options and different forms of support; especially relevant policies are not only within the field of science and technology but also related to other sectors such as taxation, education and training such as investment, human resource development and standardization policies have not kept up with the development of this field.

#### *5.1.3. Issues posed to the participation of enterprises in the STI policy process in the RE sector in Vietnam*

The legal system regulating the stakeholders' participation in the STI policy process has not specified the forms, mechanisms and methods of exercising the right to participate of stakeholders and the accountability of state entities for such participation.

In fact, the interest of enterprises in STI activities is not commensurate with the role of enterprises, most RE enterprises are looking for profits based on the State's incentives in terms of taxes, electricity prices, land, infrastructure and therefore have not found benefits when participating in the STI policy process.

Although businesses play an important role in providing inputs to the policy process, there is a lack of policy proposals to implement environmental and social goals.

### **5.2. Perspectives and orientations to increase the participation of enterprises in the STI policy process in RE sector**

- It is necessary to improve the legal system regulating the feedback mechanism to enhance the transparency of the law and the trust of enterprises in the law.

- It is necessary to have appropriate policies and initiatives to promote the strengths of stakeholders in working towards the goal of promoting STI not only to serve but also to orient the development of the RE sector in Vietnam.

- It is necessary to take measures to create motivation and pressure on enterprises to carry out STI activities for sustainable development, thereby promoting the participation of enterprises in the policy process.

- It is necessary to continue to improve policies to support enterprises in solving difficulties that affect the STI capacity and the quality of participation of enterprises in policy process.

### **5.3. Recommendations to increase the influence of enterprises on the results of the STI policy process in the field of RE**

#### *5.3.1. Improve the legal system providing for feedback mechanisms to enhance the transparency of the law and the trust of enterprises in the law*

**Purpose of the proposal:**

- Overcoming the shortcomings in the provisions of the Law on Promulgation of Legal Documents, there is no provision on the mechanism for monitoring and responding to the opinions of stakeholders in the policy process.

- Strengthen the transparency of the law and the trust of enterprises in particular and other documents towards the law so that they are motivated to participate more actively in the policy process.

**Rationales for proposal:**

- *Theoretically*: The principle of transparency in the approach to stakeholders.

- *International experience*: Develop and implement processes that mobilize full citizen participation, which ensure information is provided clearly, unbiased, evidence-based, easily accessible, and creates a level playing field for all participants to express their views.

- *Survey results*: 90% of the survey votes said that "Transparency of the policy process" is a factor affecting the participation of the stakeholders in the policy process, of which 45% of the survey respondents have a high level of influence.

- The practice of the participation of enterprises in the STI policy process shows that the State needs to specify the forms, mechanisms and methods of exercising the right to participate in the policy process and the accountability of state entities with such participation in order to establish an open, transparent and substant policy process.

**Recommendations:**

- Develop a mechanism for receiving and responding to comments and consider it a mandatory stage in the process of collecting opinions in the policy process.

- Continue to concretize the regulations on collecting opinions of enterprises in current legal documents.

- Improve the capacity of the policy-making agencies in the policy process to ensure the implementation of the basic principle in the stakeholder approach- the resource principle, paying special attention to the interdisciplinary and multi-sectoral characteristics of the RE sector and the application of information technology to the policy process.

**5.3.2. Engage appropriate actors in the policy process to develop evidence-based holistic and inclusive policies**

**Purpose of proposal:** To overcome the limitation that businesses are still less interested in proposing policies to achieve environmental and social goals.

**Rationales for proposal:**

- *Theoretically*: Based on the principles in public policy formulation and the criteria of the TIP paradigm, which are scientific, inclusive, socio-technical factors.

- *International experience*: Stakeholders can participate in all stages of the STI policy process, however, for each stage, it is necessary to prioritize the participation of different stakeholders.

- *Survey results*: Suggestions of the respondents about the stages in which stakeholders should participate.

### **Recommendations:**

It is necessary to determine the objectives and scope of the participation of enterprises in particular, other stakeholders in the policy process and design comprehensive participation processes to suit the characteristics of enterprises in the RE in Vietnam.

#### ***5.3.3. Strengthen initiatives to mobilize the participation of enterprises and other stakeholders in the formulation of STI policies aiming at environmental and social goals***

**Purpose of proposal:** To overcome the limitation that businesses are still less interested in proposing policies to achieve environmental and social goals.

#### **Rationales for proposal:**

- *Theoretically:* The characteristics of the transformative innovation policy model require the mobilization of the participation of disadvantaged groups or of the underprivileged groups to develop policies to solve the problems of disadvantaged groups.

- *International experience:* The initiative aims to mobilize the participation of the stakeholders, including: encouraging the sharing of ideas for research and innovation programs; surveying and polling opinions on issues to be studied; organizing exchanges and seminars to develop future scenarios; mobilizing participation in scientific and technological programs, organizing awards on innovation; building online cooperation platforms, building living laboratories...

- *Survey results:* According to the author's survey results, 89% of respondents suggested that it is necessary to diversify the forms of dialogue and ask for opinions from Stakeholders on policies.

### **Recommendations:**

The State develops programs to encourage open innovation such as encouraging the sharing of ideas for research and innovation programs; surveying and polling opinions on research issues; organize exchanges and seminars to develop future scenarios; mobilize participation in scientific and technological programs, organize awards on innovation; building online cooperation platforms, living laboratories...

#### ***5.3.4. Strengthen measures to create motivation and pressure on enterprises to carry out STI activities for sustainable development, thereby promoting the participation of enterprises in the policy process***

**Purpose of proposal:** To overcome the limitation of enterprises' interest in S&T, IT&M activities in fact not commensurate with the role of enterprises.

#### **Rationales for proposal:**

- *Theoretically:* According to the approach of the Communist Party, interests and power are the decisive factors for the participation of the Communist Party in the Communist Council.

- *Results of surveys and expert interviews:* 50% of respondents said that the interests of organizations/individuals are one of the factors affecting participation in the Supervisory Board process.



Experts believe that state regulations will create pressures for businesses to transform their operations towards sustainable development and development based on science, technology and innovation and thus, enterprises will be interested in policies and have the need to participate in the business council process.

**Recommendations:**

- Measures to create motivation: Improve the capacity to absorb STI, financial, market and human resource support.

- Pressure measures: The State develops a green transformation roadmap, develops regulations to implement Net Zero commitments, develops a green economy, forcing enterprises to have a roadmap for transformation and application of STI activities to their production and business.

**5.3.5. Develop a strategy to develop human resources in R&D as well as innovation in RE to promptly meet the needs of STI human, improve the quality of stakeholders' participation in the policy process**

**Purpose of proposal:** Overcoming limitations on human resources and affecting the quality capacity of science and technology to participate in the business council process of enterprises.

**Rationales for proposal:**

*Expert interview results:* Because investment in RE development is a new field, domestic universities have not had time to develop training programs to provide adequate human resources for investors. Therefore, relevant ministries and sectors need to coordinate to identify the need for technology and R&D human resources in RE to meet practical and future needs.

**Recommendations:**

- Develop a map of Vietnam's RE technology to determine Vietnam's technological capacity and develop development orientations.

- Identify the need for R&D as well as innovation human resources in RE to develop a human resource development plan in this field.

## CONCLUSION

The thesis “**Stakeholder engagement in science technology and innovation policy-making process from transformative innovation policy paradigm in renewable energy sector in Vietnam**” evaluates the participation of a stakeholder in the STI policy process from TIP paradigm through assessing the relationship and influence of participation a stakeholder plays a central role in the innovation system to the output results of each stage in the policy process in order to recommend state management agencies solutions to strengthen the role and influence of enterprises in developing, criticizing and supervising the implementation of the STI mechanisms and policies for sustainable development.

In terms of theory, the thesis contributes to the TIP research in Vietnam when building a theoretical basis for determining the influencing aspects of stakeholder participation on the output of each stage in the policy-making process according to

the transformational innovation policy (TIP) paradigm. While previous traditional approaches have mainly focused on the outputs of policymaking process of economic growth and competitiveness, this study has identified outputs under the TIP that need to address both environmental and social aspects to guide policies to address major challenges in sustainable development. Accordingly, the participation of stakeholders affects the identification, promulgation, implementation, and evaluation: (1) policy objectives to promote science, technology and innovation to solve social, environmental and economic challenges; (2) diverse, interdisciplinary and cross-sectoral policy solutions to solve major social and environmental challenges.

The study affirms the positive relationship between the stakeholder's participation on the output results of each stage in the policy process, on that basis, TIP researchers can continue to study to affirm the above relationship in different fields and countries.

In practice, on the basis of the analysis of the current situation of the relationship and the impact of the enterprises' participation as stakeholder playing a central role in the innovation system to the outputs of each stage in the policy-making process within the renewable energy sector in Vietnam according to the TIP paradigm, the thesis recommends five solutions for a number of ministries and sectors through the development and promulgation of solutions that both create motivation and pressure for enterprises to participate and improve the quality of participation and affect the results of the policy process so that businesses become the center of STI activities as set out in the Socio-Economic Development Strategy for the 2021-2030 period.

#### **Limitations and Further Research Directions**

*Limitations of the study:* Only research on business participation, not other stakeholders due to data and resource limitations; survey data from businesses in this study is mostly qualitative, which can cause problems in the quality of analysis on the impact of business participation on the results of the periods. the passage in the policy process; the number of surveys to collect information on business participation is still limited.

*Next research direction:* As analyzed in the thesis, the degree of influence of enterprises depends on the scientific and technological capacity of enterprises. Therefore, further studies can study the impact of enterprises at scale on the results of the policy process in the field of renewable energy or in other fields in countries with different socio-economic development contexts from Vietnam.

## LIST OF THE AUTHOR'S RESEARCH PROJECTS RELATED TO THESIS TOPIC

1. Dang Thu Giang, Hoang Minh, Bach Tan Sinh, Tran Quang Huy, “Transformative innovation policy: Theoretical review and initial implications for Vietnam”, *International Conference on science, technology and innovation policies and initiatives for sustainable development*, Hà Nội, 8/12/2022.

2. Dang Thu Giang, “Characteristics of transformative innovation policy and implications for stakeholder engagement in science technology and innovation policymaking process for sustainable development”, *International Conference on Human resources for sustainable development*, Hà Nội, 14-15/12/2023.

3. Dang Thu Giang, Bach Tan Sinh, Tran Quang Huy, “Shifting the role of stakeholders in science, technology and innovation policy making from the transformative innovation policy approach - the case of the renewable energy in Vietnam”, *International Conference "Approaches to the Twin Transitions: Digitalization and Climate Change in Developing Countries"*, thành phố Hồ Chí Minh, 30-31/7/2024.

4. Dang Thu Giang, “Some issues on the stakeholders participation in the STI policy process in the new context, *Journal of Science and Technology Policy and Management, Volume 3/2023*.

5. Dang Thu Giang, Bui Ngoc Thu Ha, “Characteristics of the Transformative Innovation Policy Framework and Implications for Vietnam's STI Policy Development”, *Journal of Science and Technology Policy and Management, Volume 3/2022*, pp. 85-102.

6. Dang Thu Giang, Bui Ngoc Thu Ha, “Transformational Innovation Policy: Theory and International Experiences”, *Journal of Science and Technology Policy and Management, Volume 4/2022*, pp. 77-93.