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Best Practice Guidance for Effective Methane Recovery and Use from Abandoned Coal Mines

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Foreword

Coal remains central to the energy mix of many countries. Inevitably, coal reserves are depleted as coal extraction progresses and mines are closed and abandoned. Abandoned mines continue to emit methane for many years after closure, yet their emissions remain unchecked and uncounted in many coal producing regions.

Methane is a powerful greenhouse gas (GHG), and recent research has shown that the impact of methane in the atmosphere is far more extensive than was originally thought. Coal mines are the fourth largest source of anthropogenic methane emissions after the oil and gas sectors, landfills and livestock industries. Technological advances have made it possible to significantly reduce methane emissions from the gassiest working mines. Closed mines can provide a small but significant opportunity to exploit a clean energy resource, known as Abandoned Mine Methane (AMM), that can be extracted and used. AMM capture and use offers many benefits, such as improved safety, air quality and health, energy supply and environmental performance. Technology exists that can recover methane from abandoned coal mines.

This document is aimed at raising awareness of AMM opportunities and hazards by providing accessible high-level guidance for senior corporate, government and financial decision-makers – all of whom play an integral role in decisions to implement best practices. Recommended principles and standards on coal mine methane (CMM) capture and use have already been set out in the Best Practice Guidance on Effective Methane Drainage and Use in Coal Mines. This document complements that guidance and is aimed at completing the coal mining cycle by considering the methane emissions that continue after mining has ceased and mines have closed.

The AMM Best Practice Guidance does not replace or supersede laws and regulations or other legally binding instruments, whether national or international. A clear legal framework and supportive policies can help in getting methane to market. The principles outlined herein are intended to provide guidance to complement existing legal and regulatory frameworks and to support development of post-mining projects to reduce the overall emissions attributable to the coal mining life cycle by optimising recovery and use of methane that would otherwise be released to the atmosphere. To gain a greater understanding about the potential growth of these emissions, UNECE member states and the Global Methane Initiative members are urged to consider ways to improve their knowledge of the magnitude and rate of growth of this emission source by including methane emissions from abandoned underground coal mines in their national inventories.

Guided by the Group of Experts on Coal Mine Methane, countries such as Poland and China have established International Centres of Excellence on CMM (ICE-CMM) to promote adoption of best practices in CMM extraction and use. The centres are positioned to disseminate AMM best practices in countries where they are established. In other countries, our hope is that similar agencies or organizations with responsibility for managing mine closures and AMM will find this guide practical and insightful in exploring options to utilize AMM resources.

Olga Algayerova
Executive Secretary
United Nations Economic
Commission for Europe

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Sponsoring Organisations

The **United Nations Economic Commission for Europe** (UNECE) is one of the five UN Regional Commissions that provides a forum through which 56 countries of North America and Western, Central, and Eastern Europe as well as Central Asia come together to forge the tools of their economic cooperation. The main areas of UNECE's activity are: economic cooperation and integration, environment policy, forests, housing and land, population, statistics, sustainable energy, trade, and transport. UNECE pursues its goals through policy analysis, the development of conventions, regulations and standards, and the provision of technical assistance. Energy related topics such as coal mining and coal mine methane are discussed by the member states in the Committee on Sustainable Energy (CSE). The Group of Experts on Coal Mine Methane convenes as a subsidiary body of the CSE meeting regularly to discuss issues and promote best practices for management, capture and use of the methane gas liberated during the coal mining life cycle (www.unece.org/energy/se/cmm.html).

The **Global Methane Initiative** (GMI) is an international public-private partnership that works with government agencies around the world to facilitate project development in five key methane-producing sectors: agricultural operations, coal mines, municipal solid waste, oil and gas systems, and wastewater. Launched in 2004, GMI works in concert with other international agreements, including the United Nations' Framework Convention on Climate Change (UNFCCC), to reduce greenhouse gas (GHG) emissions. Unlike other GHGs, methane is the primary component of natural gas and can be converted to usable energy. The reduction of methane emissions, therefore, serves as a cost-effective method to reduce GHGs and increase energy security, enhance economic growth, improve air quality and improve worker safety. The Global Methane Initiative is comprised of 44 partner countries and the European Commission, representing about 70 percent of the world's anthropogenic methane emissions. With respect to coal mine methane, GMI's Coal Subcommittee brings together key experts in coal mine methane recovery and utilisation to share information about state-of-the-art technologies and practices through a number of workshops, trainings, study tours, and capacity-building initiatives (www.globalmethane.org).

Structure

The drafting work was assisted by the financial, technical and administrative support of the United States Environmental Protection Agency through GMI.

The principal author of this guide is David Creedy of Sindicatum Sustainable Resources with contributions from Raymond C. Pilcher, Raven Ridge Resources, and Neil Butler, HEL-East Ltd.

Knowledge, experience, and case studies were contributed by:

- Clemens Backhaus, A-TEC Anlagentechnik GmbH
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- James Marshall, Raven Ridge Resources

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- Michal Drabik, UN Economic Commission for Europe
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