

Zimbabwe Coal Bed Methane Gas Natural Gas Coal

Coalbed Methane
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Coal Bed Methane
Fundamentals of Coalbed Methane
Management and Effects of Coalbed Methane
Produced Water in the Western United States
Just Energy Transitions and Coal Bed Methane
Advanced Reservoir and Production Engineering for Coal Bed Methane
Coalbed Methane in India
Coalbed Methane: Scientific, Environmental and Economic Evaluation
Coalbed Methane in China
Coalbed Methane and Coal Geology
Northern San Juan Basin Coal Bed Methane Project
Coal Bed Methane
Coalbed Methane/natural Gas in Coal
Coalbed Methane Extraction
The Orderly Development of Coalbed Methane Resources from Public Lands
Coalbed Methane Development in Montana
A Strategy for Coal Bed Methane and Coal Mine Methane Development and Utilization in China
Coalbed Methane Emissions
Coal Bed Methane Desorption Data
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Pramod Thakur
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Theresia Betty Sumarno
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methane stored in coalbeds has emerged as an energy source that offers a viable alternative to fossil fuels this reference discusses the principles of methane storage in coal and the practices of producing the methane economically and provides an analysis of the coalbed methane process

coal bed methane theories and applications second edition captures the full lifecycle of a coal bed methane well and offers petroleum geologists and engineers a single source for a broad range of coal bed methane cbm applications the vast coal resources in the united states continue to produce tremendous amounts of natural gas contributing to a diverse range of energy assets this book addresses crucial technical topics including exploration and evaluation of coal bed reservoirs hydraulic fracturing of cbm wells coal seam degasification and production engineering and processing among others the book also covers legal issues and permitting along with an economic analysis of cbm projects this new edition includes information on new and established research and applications making it relevant for field geologists and engineers as well as students

coal bed methane from prospect to pipeline is the proceedings of the 25th anniversary of the north american coal bed methane forum it

provides the latest advancements in the production of coal bed methane covering a variety of topics from exploration to gas processing for commercial utilization additionally it presents the origin of gas in coal reservoir engineering control of methane in coal mines production techniques water management and gas processing the vast coal resources in the united states continue to produce tremendous amounts of natural gas contributing to a diverse range energy assets following a rapid advancement and subsequent plateau in technological developments this book captures the full life cycle of a well and offers petroleum geologists and engineers a single source of a broad range of coal bed methane applications this book addresses crucial technical topics including exploration and evaluation of coal bed reservoirs hydraulic fracturing of cbm wells coal seam degasification and production engineering and processing among others it also covers legal issues permitting and economic analysis of cbm projects edited by a team of coal bed methane experts from industry academia and government who have more than 75 years of combined experience in the field authored by well recognized members of the gas and coal industry universities us government departments such as the department of energy and the national institute of occupational safety and health niosh more than 200 figures photographs and illustrations aid in the understanding of the fundamental concepts presents the full scope of improvements in us energy independence coal mine safety and greenhouse gas emissions

we will discuss various aspect of technology for the evaluation and development of coalbed methane cbm reservoirs this article discusses the gas storage and flow mechanism in cbm reservoirs their differences with conventional gas reservoirs and their impact on production behavior in addition the impact of mechanical properties of coal on cbm reservoirs is discussed coalbed methane cbm or coal bed methane is a form of natural gas extracted from coal beds in recent decades it has become an important source of energy in united states canada australia and other countries the term refers to methane adsorbed into the solid matrix of the coal it is called sweet gas because of its lack of hydrogen sulfide the presence of this gas is well known from its occurrence in underground coal mining where it presents a serious safety risk coalbed methane is distinct from a typical sandstone or other conventional gas reservoir as the methane is stored within the coal by a process called adsorption the methane is in a near liquid state lining the inside of pores

within the coal called the matrix the open fractures in the coal called the cleats can also contain free gas or can be saturated with water in some coalbeds naturally occurring water pressure holds methane the main component of natural gas fixed to coal surfaces and within the coal in a coalbed methane cbm well pumping water from the coalbeds lowers this pressure facilitating the release of methane from the coal for extraction and use as an energy source water pumped from coalbeds during this process cbm produced water is managed through some combination of treatment disposal storage or use subject to compliance with federal and state regulations cbm produced water management can be challenging for regulatory agencies cbm well operators water treatment companies policy makers landowners and the public because of differences in the quality and quantity of produced water available infrastructure costs to treat store and transport produced water and states legal consideration of water and produced water some states consider produced water as waste whereas others consider it a beneficial byproduct of methane production thus although current technologies allow cbm produced water to be treated to any desired water quality the majority of cbm produced water is presently being disposed of at least cost rather than put to beneficial use this book specifically examines the powder river san juan raton piceance and uinta cbm basins in the states of montana wyoming colorado new mexico and utah the conclusions and recommendations identify gaps in data and information potential beneficial uses of cbm produced water and associated costs and challenges in the existing regulatory framework

this book discusses how coal bed methane cbm could help the acceleration of the energy transition in a just way in indonesia due to the country s potential cbm reserves and current dependence on climate damaging coal developing countries face multiple challenges in achieving their energy transitions cbm in indonesia could potentially be a catalyst for energy transition and subsequently improve access to energy however cbm faces numerous challenges and although indonesia first developed its domestic cbm sector over more than a decade ago they are still to implement this successfully this book exposes the challenges and opportunities of cbm exploring what lessons other countries could learn from indonesia to improve the industry with a view to achieving energy transition and climate change targets this book will be an invaluable reference for researchers and practitioners working in this field

advanced reservoir and production engineering for coal bed methane presents the reader with design systems that will maximize production from worldwide coal bed methane reservoirs authored by an expert in the field with more than 40 years of experience the author starts with much needed introductory basics on gas content and diffusion of gas in coal crucial for anyone in the mining and natural gas industries going a step further chapters on hydrofracking horizontal drilling technology and production strategies address the challenges of dewatering low production rates and high development costs this book systematically addresses all three zones of production levels shallow coal medium depth coal and deep coal with coverage on gas extraction and production from a depth of 500 feet to upwards of 10 000 feet strategies which cannot be found in any other reference book in addition valuable content on deep coal seams with content on enhanced recovery a discussion on co2 flooding infra red heating and even in situ combustion of degassed coal giving engineers a greater understanding on how today s shale activities can aid in enhancing production of coal bed for future natural gas production delivers how to recover and degas deeper coal seams while lowering development costs addresses both sorption process and irreducible fraction of gas in coal with examples based on the author s 40 plus years of direct experience explains how the same techniques used for production from deep shale activity can produce gas from deep coal seems with the help of enhanced recovery leading to increased gas production

this book offers a first of its kind standalone review of coalbed methane cbm in india covering all the major technical and policy aspects as an authoritative text on cbm in india it addresses the essential geological engineering and policy issues the coalbed methane industry is a rapidly developing sector in indian energy supply the book presents the characteristics of coal beds in india s damodar and son river valleys which influence the commercial viability of cbm in the regions as well as a study of the gas contents of the country s major coalfields the book begins with a brief review of methane emissions from indian coal mines and the current coalbed methane situation in the country its unique features include a coalfield by coalfield technical assessment of cbm throughout india policy matters are addressed including the national exploration licencing policy help of the indian government ministry of petroleum and natural gas which is vital to an overall understanding of cbm development in the country the scope and depth of its book s coverage will benefit

students practising engineers researchers and policy makers

coalbed gas has been considered a hazard since the early 19th century when the first mine gas explosions occurred in the united states in 1810 and france in 1845 in eastern australia methane related mine disasters occurred late in the 19th century with hundreds of lives lost in new south wales and as recently as 1995 in queensland s bowen basin ventilation and gas drainage technologies are now in practice however coalbed methane recently is becoming more recognized as a potential source of energy rather than emitting this gas to the atmosphere during drainage of gassy mines it can be captured and utilized both economic and environmental concerns have sparked this impetus to capture coalbed methane the number of methane utilization projects has increased in the united states in recent years as a result to a large extent of development in technology in methane recovery from coal seams between 1994 and 1997 the number of mines in alabama colorado ohio pennsylvania virginia and west virginia recovering and utilizing methane increased from 10 to 17 the environmental protection agency estimates that close to 49 billion cubic feet bet of methane was recovered in 1996 meaning that this amount was not released into the atmosphere it is estimated that in the same year total emissions of methane equaled 45.7 bcf other coal mines are being investigated at present many of which appear to be promising for the development of cost effective gas recovery

the coalbed methane cbm reserve in china ranks third in the world with a total resource of 36.8 1012 m3 exploitation of cbm has an important practical significance to ensure the long term rapid development of china natural gas industry therefore in 2002 the ministry of science and technology of china set up a national 973 program to study cbm system and resolve problems of cbm exploration and exploitation in china all the main research results and new insights from the program are presented in this book the book is divided into 11 chapters the first chapter mainly introduces the present situation of cbm exploration and development in china and abroad chapters 2 through 9 illustrate the geological theory and prospect evaluation methods then chapters 10 and 11 discuss cbm recovery mechanisms and technology the book systematically describes the origin storage accumulation and emission of cbm in china and also

proposes new methods and technologies on resource evaluation prospect prediction seismic interpretation and enhanced recovery the book will appeal to geologists lecturers and students who are involved in the cbm industry and connected with coal and conventional hydrocarbon resources research

resources of coalbed methane cbm methane trapped within the porous system of coal are many times greater than the collective reserves of all the known conventional gas fields yet only in the united states has this energy source been tapped as coal is both the source rock and the reservoir for cbm there is a major paradox whereby in order for gas sourced by the coal not to have migrated the coal must either be sealed or possess very low permeability and yet for the coal bed to be an effective reservoir the gas must readily migrate into the production well the solution to this paradox lies in a wide ranging understanding of the geology of coal and this volume aims to provide some of the answers

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this report reviews the extraction of methane from coalbeds as a resource in its own right and not as a mining hazard emission or by product

china is short of clean energy particularly conventional natural gas the proven per capital natural gas reserve is only 1 12th of the world average however china has large coal bed methane cbm resources with development potential which can be recovered from surface boreholes independent of mining and in advance of mining and also captured as a part of underground coal mining operations however in order to meet its targets the government must improve the administrative framework for cbm resource management introduce more effective cbm or coal mine methane cmm development incentives raise the technical capacity of the mining sector expand gas pipeline infrastructure and promote gas markets in coal mining areas in order to significantly reduce methane emission from coal mines and better exploit the gas recoverable from coal seams the government should introduce measures to strengthen the cbm cmm policy legal and regulatory framework to improve resource management improve cmm availability and quality so more can be utilized enhance incentives to promote expansion of cbm cmm exploitation and destruction of surplus drained cmm and promote development of regional development strategies to take advantage of specific local advantages

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