



# AG

ADJACENT GOVERNMENT | February 2016

## 234 | USING BIOMETRICS TO FIGHT CRIME

INTERPOL highlights how biometrics can be used globally to investigate crime and tackle terrorism

### ALSO IN THIS ISSUE

**28 | Vaccinating against seasonal flu**

**Caroline Brown** at WHO tells Editor Laura Evans the reasons why vaccinations are important to help reduce influenza cases

**94 | Inspiring growth in the aerospace industry**

**John Laughlin** at Innovate UK answers Adjacent Government's questions regarding investment in the aerospace industry

**209 | Competition in connections**

**James Veaney** at Ofgem explains to the Editor why competition in electricity connections is integral to the market





# Foreword

**Markku Markkula**  
**President**  
**European Committee of the Regions**

**T**he EU and its Member States have faced unprecedented challenges in recent years. Citizens rightly demand more jobs and long-term sustainable growth. They expect a more effective response to migration. They want to see all governments maintain stability in and outside EU borders. These issues directly affect Europe's local and regional governments and the communities they serve which is why they are priorities for the European Committee of the Regions. The answers lie in deepening cooperation among all spheres of society and delivering a new entrepreneurial mind-set. We need to engage all levels of government and strive to create a Europe that meets these 21st century challenges.

Realising this change in mind-set must start by making better simpler EU legislation that delivers jobs and demonstrates the added value of the EU. Unemployment has fallen from 11.5% in 2014 to 10.5% in 2015 but this is not enough. This is why first and foremost economically profitable, socially inclusive and sustainable growth is the priority for local and regional governments. We recently held a Europe-wide survey with the OECD which showed that public investment has fallen in over 40% of local and regional governments since 2010. Recovering from the crisis and creating a prosperous Europe must start by closing this development gap. Investment has fallen due to increased social burden and falling tax-income, but also due to the inability to deliver innovative collaboration between all levels of government.

Sustainable growth can only be delivered by pulling resources from all sectors and through joint collaboration between the public, private and civil sectors. The EU must listen to the knowledge, experience and understanding of those delivering legislation on the ground to progress and move forward. Given three-quarters of EU laws are implemented by local and regional governments, creating an EU that works must take into account the territorial impact of its policies and initiatives.

The Committee – the EU's institution of local and regional leaders – is committed to supporting entrepreneurialism, investing in start-ups, growing industries and driving partnerships based on smart specialisation. As local and regional leaders we know what works and what investment is needed. For many regions and cities the €350bn of EU structural funding and the recently launched EU Investment Plan are lifelines that can make the difference in delivering

services and attracting private investment. This is why the Committee is working in partnership with the European Commission and the European Investment Bank to exploit the opportunities offered by these 2 financing tools.

**“Sustainable growth can only be delivered by pulling resources from all sectors and through joint collaboration between the public, private and civil sectors.”**

Given the impact on communities and public services, managing migration in Europe is high on the political agenda. Part of the response must be through building ties across borders. The Committee is continuing to work through platforms, such as the Euro-Mediterranean Regional and Local Assembly (ARLEM), where local and regional leaders from in and outside Europe meet to share challenges and co-create solutions. Only in January we agreed during our ARLEM meeting in Cyprus to co-create “The Nicosia Platform” which will assist Libyan cities.

What is clear is that we must try new methods to build a better Europe. We need more open innovation. We need more experimenting, piloting and rapid prototyping. We need to use the knowledge and expertise in all sectors to create new jobs, drive prosperity and create sustainable communities. The EU needs to reinvent itself to reflect the changing times of our world and show it can reform. It needs to reassert the fundamental principles it was founded upon – a progressive Europe built on aspiration, social cohesion, liberty, democracy, equality, the rule of law and respect for human rights, guided by subsidiarity. We must always ask ourselves before introducing new EU laws or deciding how to spend our precious resources: how does it benefit citizens. ■

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Registered in England & Wales.  
Company Reg No. 8667479.  
VAT Registration No. 169 9152 64.

# Introduction

**W**elcome to the first edition of 2016. As we head into a New Year, growth and jobs remain the key priority for the European Commission – despite the European Union managing a number of crises, such as climate change.

In the President's New Year Conference, President Jean-Claude Juncker underlined his determination to focus on this priority within the Commission. Juncker called on Member States to pursue the strategy set out by the Commission a year ago and announced major progress from the €315bn Investment Plan.

The edition kicks off with a Foreword from President of the Committee of the Regions Markku Markkula, who outlines challenges that Member States have faced over the years and the importance of sustainable growth and investment to build a better Europe.

Other areas of crisis in Europe at the moment include the refugee crisis and climate change. In this February edition we look at the COP21 Paris conference and hear from organisations as to whether opportunities were missed at the December conference.

We shine the light on COP21 in the energy section, with articles from the European Economic and Social Committee (EESC) and the European Geothermal Energy Council looking at

what needs to be done now to turn promises into actions.

The security section focuses on another key crisis. Paris and Brussels saw unprecedented violence last year with terrorist attacks affecting both cities. Adjacent Government looks at The European Agenda on Security and how biometrics can help in the fight against crime and terrorism.

An article from EUROPOL outlines how the internet has become a powerful tool for terrorists and how the organisation is combating this problem through the European Union Internet Referral Unit (EU IRU). A piece by INTERPOL similarly highlights how biometrics can be used globally to investigate and tackle terrorism.

Other areas of focus in this early edition include: the circular economy; ocean research & climate change; fire safety management; the obesity crisis; digital health for the ageing; and the value of vaccines worldwide.

As always, I hope you find the articles featured informative and useful, and welcome any feedback you may have. ■

# CONTENTS



## HEALTH AND SOCIAL CARE

### **10 | Key health priorities for Europe**

Adjacent Government highlights a speech by the EU Commissioner for Health, Vytenis Andriukaitis at the Bulgarian Parliament in December 2015

### **28 | Vaccinating against seasonal flu**

Caroline Brown, Head of the Influenza & Other Respiratory Pathogens Programme at the World Health Organization (WHO) Regional Office for Europe tells Editor Laura Evans the reasons why vaccinations are so important to help reduce influenza cases

### **33 | Highlighting healthcare-associated infections**

Sascha Marschang, Policy Manager at the European Public Health Alliance (EPHA), discusses healthcare-associated infections and antimicrobial resistance (AMR)

### **35 | Funding the future of HIV in the UK**

Debbie Laycock, Head of Policy at the Terrence Higgins Trust sheds light on the future of HIV among budget cuts and already stretched key services

### **37 | Tackling childhood cancer**

Hollie Chandler, Senior Policy Advisor at Cancer Research UK highlights the work being done to improve treatment for childhood cancers

### **41 | Understanding palliative care**

Julie Ling, CEO of the European Association for Palliative Care sheds light on palliative care and how it puts the patient first in terms of treatment

### **45 | Palliative care in Canada**

Gabriel Miller, Director of Public Issues at the Canadian Cancer Society outlines how palliative care has developed in Canada and its benefits

### **51 | We need a technology revolution in the healthcare sector**

John Bowis, OBE, Honorary President of Health First Europe explains how eHealth can bring the technology revolution to healthcare

### **54 | Transforming healthcare in Scotland**

The Scottish Government's eHealth Division outlines why eHealth is a key enabler for citizen involvement and the transformation of health and social care in Scotland

### **56 | Transforming ageing into an opportunity for Europe**

Ilias Iakovidis and Bruno Alves from DG CONNECT at the European Commission explain how digital transformation can turn demographic change into an opportunity for Europe

### **61 | Housing support for an ageing population**

Domini Gunn, Director of Health and Wellbeing at CIH Consultancy outlines the potential for the right kind of housing and support to reduce the burden and improve the quality of life of older people

### **63 | Assisting people to live well with dementia**

Colin Capper, Head of Research Development and Evaluation at Alzheimer's Society details how assistive technology can help people with dementia lead independent lives

### **65 | Musculoskeletal disorders in the workplace**

Christa Sedlatschek, Director at the European Agency for Safety and Health at Work outlines how musculoskeletal disorders affect workplaces across Europe

### **69 | Tackling healthcare fraud**

Joel Alleyne from the Global Health Care Anti-fraud Network (GHCAN) outlines how the organisation helps with the fight against healthcare fraud

### **73 | Resilience in healthcare**

Dominic Smith, Marketing and Client Relationship Manager at Rothwell Douglas Ltd asks what more healthcare organisations can do for their employees

### **77 | Reducing the obesity burden**

Dr João Breda and Jo Jewell from WHO Regional Office for Europe highlight the latest projections in regards to obesity throughout Europe and how WHO work with countries to reduce the burden

### **80 | Transforming mental health**

Helen Gilbert, Policy Fellow at the King's Fund explains why it's time to put quality at the forefront of mental health investment

### **86 | Climate change and human health: three truths**

John Balbus, Senior Advisor for Public Health at the National Institute of Environmental Health Sciences, outlines the connection between climate change and human health in 3 stages

### **90 | Health research - the Canadian way**

Adjacent Government looks at how health research can play a pivotal role in preventing major diseases throughout the country



## SCIENCE AND RESEARCH

### 94 | Inspiring growth in the aerospace industry

John Laughlin, Aerospace Programme Lead at Innovate UK answers Adjacent Government's questions regarding investment in the aerospace industry and how Innovate UK play an integral role in this

### 99 | Space is anything but empty

Sean Murphy from the Defence Science and Technology Laboratory (Dstl) highlights the role space plays in defence technologies and capabilities

### 101 | Full steam ahead: STEM, engineering and Brunel save the day!

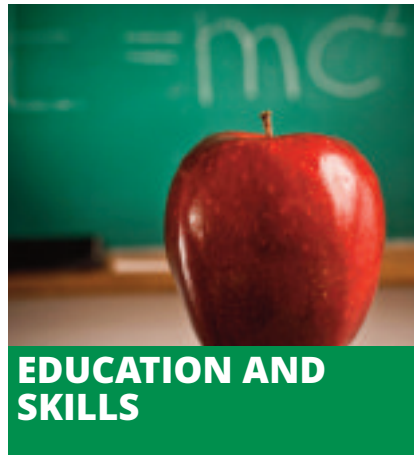
Clair Prosser, Press Officer at BSRIA highlights how the organisation are hoping to inspire engineers of the future

### 106 | Chemistry and climate change

Santiago V. Luis, Chair of the Chemistry and Environment Network at EuCheMS outlines how chemistry can play a vital role in tackling climate change

### 114 | Gender equality in Switzerland today

Brigitte Liebig, President of the Steering Committee NRP 60 at the Swiss National Science Foundation outlines the results of the NRP 60 program and how it hopes to create knowledge regarding gender equality in Switzerland



## EDUCATION AND SKILLS

### 118 | Transforming higher education in the UK

Adjacent Government outlines the government's plans to ensure higher education in the UK is value for money for students

### 126 | Apprenticeships: where should we direct the money?

Nida Broughton from the think tank the Social Market Foundation shares her thoughts on whether apprenticeships are good value for money

### 130 | The benefits of bringing 3D printing into the classroom

Wyn Griffiths, Senior Lecturer at Middlesex University outlines how 3D printing can bring excellent benefits for both students and teachers into the classroom



## THE BUILT ENVIRONMENT

### 133 | The EU Urban Agenda for our cities of tomorrow

European Parliament MEP, Lambert van Nistelrooij outlines why cities are the engine for economic growth and are integral for the EU Urban Agenda

### 138 | On the way to sustainable concrete structures?

Prof. Dr. Bernhard Elsener of ETH Zurich – Institute for Building Materials details the importance of achieving sustainability within the cement industry

### 144 | How upcoming rail developments are safeguarding talent for the future

Neil Wilkie, Group Head of Fusion People, discusses the impact of rail developments on the job market

### 146 | BIM 4 FM – May the force be with you

Mike Packham, Partner of Bernard Williams Associates and BIFM member provides the highlights from May Winfield's recent presentation examining the dark side of the legal issues surrounding BIM and the FM sector

### 151 | Defining Digital Built Britain

Paul Oakley, BRE BIM Director examines the current state of play in the drive for coordinated data standards for information exchange, in order to deliver on the Digital Built Britain goals

### 153 | Managing fire safety in hospitals

Adjacent Government highlights the problem of failing fire alarm systems in hospitals around the UK and how the Department of Health guidance document aims to help to tackle the issue

### 156 | Management of fire safety

The Chief Fire Officers Association give an overview of how fire safety management is integral to reducing fire hazards within public buildings

### 158 | Ensuring fire safety

Association for Specialist Fire Protection CEO Wilf Butcher explains the vital role played by passive fire protection within buildings, and outlines issues that must be considered

### 162 | Fire alarm power efficiency

The Fire Industry Association's CEO Ian Moore, explains the importance of ensuring efficient power for fire and security alarm systems in line with environmental concerns



## ENVIRONMENT

### 164 | Investing in a greener future

EU Commissioner for the Environment Karmenu Vella explains how the EU's LIFE programme can contribute to a low-carbon, resource-efficient and sustainable future

### 174 | The circular economy opportunity

The Ellen MacArthur Foundation sheds light on the circular economy and why it is an opportunity not to be missed

### 176 | The importance of soils

Matt Aitkenhead, a Member at the British Society of Soil Science sheds light on soils and their role in society and economic development

### 186 | Climate Change: Ignore the ocean at your peril

Niall McDonough, Executive Secretary at the European Marine Board outlines why the ocean should be part of the climate change discussion

### 190 | Through the ocean darkly

Carol Anne Clayson, Director of the Ocean and Climate Change Institute at the Woods Hole Oceanographic Institution details the impact the oceans have on climate systems

### 192 | Rapid change of the Arctic climate system and its global influences

Dr Takashi Yamanouchi from the National Institute of Polar Research highlights the Green Network of Excellence (GRENE) Arctic Climate Change Research project and its impact

### 196 | Understanding glacial archaeology

Associate Professor Ivar Berthling from the Department of Geography at the Norwegian University of Science and Technology explains why cold ice patches turn out to be landscape hot spots



## ENERGY

### 198 | COP21 – a historic agreement but the real work starts now

Petr Zahradník, Lutz Ribbe and Isabel Caño Aguilar members of the European Economic and social committee (EESC) highlight the key role of civil society in driving the low-carbon economy transition

### 202 | How much does it cost to save the world?

Georgina Dowling, Associate at Ramboll UK outlines the importance of investment in infrastructure to help tackle climate change

### 204 | The outcomes of COP21: Did it deliver?

Professor Jim Watson, Director, UK Energy Research Centre gives an overview of COP21 and whether it delivered on the promises

### 205 | Turning global promises into local action

Alexandra Latham, Communications Officer at the European Geothermal Energy Council details how geothermal energy can play a role in the fight against climate change following COP21 in Paris

### 207 | Energy efficiency is infrastructure

Fraser Wallace, Policy Advisor for the Sustainable Energy Association argues that the government need to urgently recognise energy efficiency as infrastructure as part of the new National Infrastructure Commission

### 209 | Competition in connections

Competition in electricity connections is integral to the market; here James Veaney, Head of Electricity Connections and Constraint Management at Ofgem tells Editor Laura Evans why

### 212 | Has the tide begun to turn?

Rhodri Glyn Thomas a Member of the European Committee of the Regions (COR) highlights why policymakers should start paying much more attention to ocean energy



## ICT

### 218 | How to make the Digital Single Market consumer-driven

Agustin Reyna, Senior Legal Officer at BEUC – The European Consumer Organisation outlines the 3 key areas needed from the Digital Single Market Strategy

### 222 | CSR: delivering on the digital transformation agenda

Can digital services reap rewards for councils and taxpayers? Alan Mo, Research Director at Kable discusses how digital infrastructure is helping local authorities



## SECURITY

### 224 | Making Europe safe for all

Adjacent Government highlights comments from the EU Commissioner for Home Affairs, Dimitris Avramopoulos from a speech in 2015 regarding the European Agenda on Security

### 232 | The European Union Internet Referral Unit at Europol

Corporate Communications at Europol outline how the internet has become a powerful tool for terrorists and how they aim to combat this problem

### 234 | Using biometrics to fight crime

INTERPOL highlights how biometrics can be used globally to investigate crime and tackle terrorism

### 238 | Access control and what the future looks like

Never has there been a more important time for both public and private sector organisations to ensure that their security measures are as effective as possible. James Kelly, Chief Executive of the BSIA discusses access control and what the future looks like

## INDEX

# A new era for soil mapping

From its inception less than 150 years ago, soil mapping was subject only to small, gradual changes. This changed radically about fifteen years ago, when digital soil mapping was introduced. While conventional soil mapping is characterised by experienced soil surveyors walking in the field and delineating soil mapping units by hand with the help of soil drillings and aerial photographs, digital soil mapping mainly takes place behind a computer screen. It makes use of mathematical and statistical models to predict soil characteristics from explanatory environmental variables, such as geology, climate, land use and terrain features.

These models need to be calibrated with soil observations, but the strong reliance on explanatory variables means that similar accuracy levels can be reached with considerably fewer observations, leading to a dramatic reduction in field and laboratory costs. For instance, we know that soil organic carbon concentration depends heavily on climate, mineralogy and land use. Thus, predicting the soil organic carbon concentration at any one location can greatly benefit from knowing these environmental variables.

While these variables may not have been readily available in the past, nowadays they are abundant at ever-increasing spatial and temporal resolutions, given the constant growth, both in quantity and quality, of satellite imagery. Digital soil mapping also increasingly benefits

from electromagnetic measurements collected by airplanes, unmanned aerial vehicles (i.e. drones) and non-invasive soil sensing instruments mounted on tractors and sleds. The exponential growth of digital soil mapping is also explained by rapid developments in statistical machine-learning techniques that can detect complex patterns in big data, and by the constant increase in computing power. While 10 years ago digital soil mapping still was an experimental technique, mainly developed and used by academics, nowadays it is an operational technique used by soil mapping organisations all across the globe to deliver soil maps for professional applications.

The figure shows a map of the topsoil organic carbon content for Africa as obtained using digital soil mapping. In this particular example, the map was derived from 130 layers of environmental variables and calibrated using 28,000 soil point observations. The statistical model used was a Random Forest machine-learning algorithm. A zoom-in on Mount Kilimanjaro shows the very fine spatial resolution achieved.

This map, which was produced by ISRIC in the framework of the AfSIS<sup>1</sup> project, is just one example of a set of over 100 maps of various soil properties at various depths. Among the other soil properties mapped are soil nutrients, available water capacity, and rootable depth. These soil properties are extremely useful for agronomic applications and fertiliser

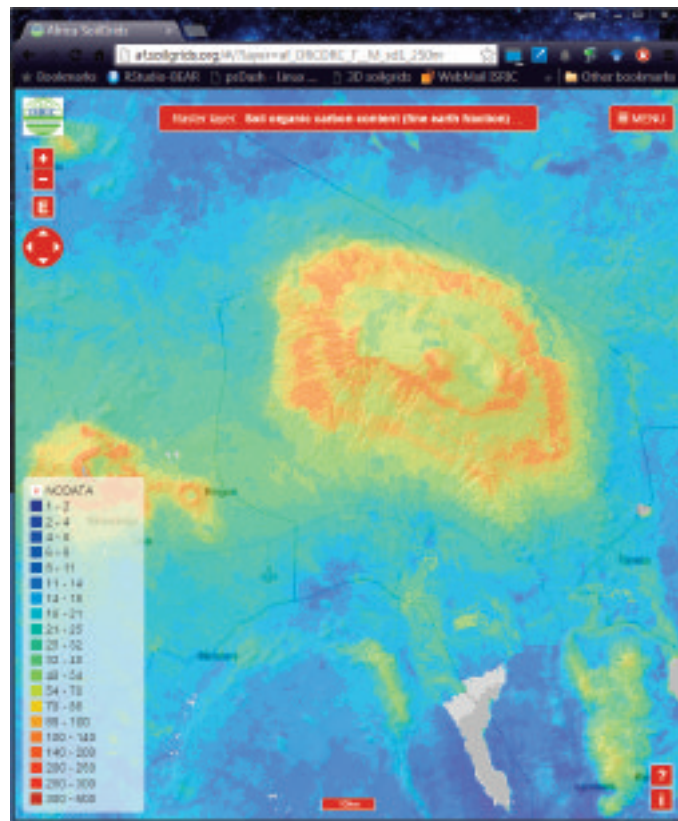
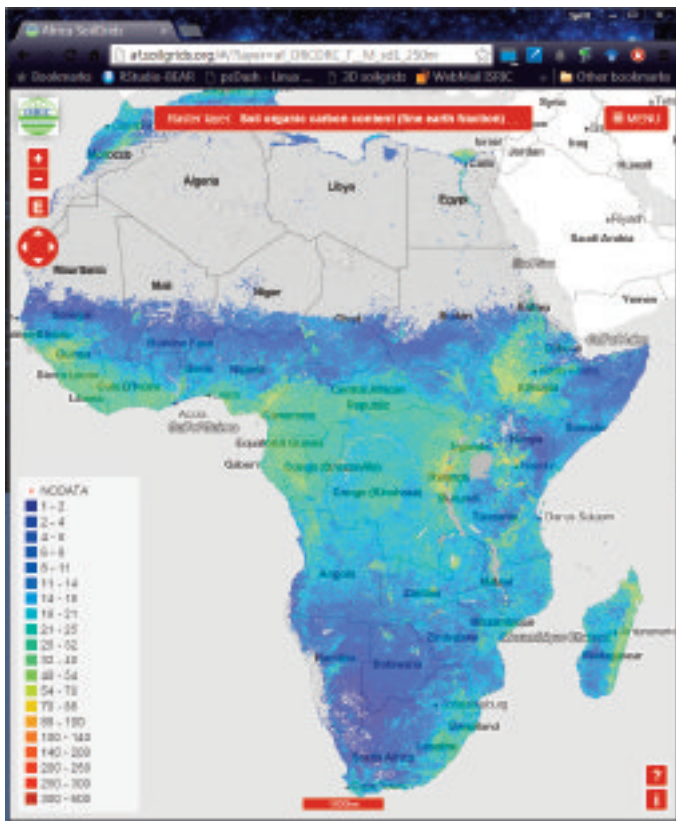


Rik van den Bosch, Director

recommendations which are not easily derived from conventional soil maps.

Digital soil mapping is now a core activity of all major soil institutions in the world, as well as collaborative initiatives such as GlobalSoilMap<sup>2</sup> and the Global Soil Partnership<sup>3</sup>. Important advantages compared to conventional soil mapping are that it is cheaper, reproducible, can be automated and produces maps that are easily updateable. In many cases the uncertainties associated with the predictions are also quantified. Digital soil maps can be tailored to specific needs, by adjusting the scale and resolution, while resulting maps are served through web-services that extend to mobile devices (e.g. the Soil-Info app<sup>4</sup>). The latter also facilitates the uploading of new soil data, which may then be used to recompute maps and further improve accuracy. Indeed, it is envisaged that crowd-sourced soil data may become a major input to digital soil mapping projects in the near future.





Topsoil (0-5 cm) organic carbon content in permilles for Africa and a zoom-in on Mount Kilimanjaro (from Hengl et al., 2015<sup>5</sup>)

The popularity and growth of digital soil mapping also has important implications for users of soil information. Soil mappers are now able, much better than before, to provide researchers, industry and policy makers with the soil information they really need. For instance, while conventional soil mapping is time consuming and hence not very suited for monitoring soil change, this is much easier in a digital soil mapping world where updated soil maps can be produced almost on the fly.

The ability to monitor soil change over large areas may well prove an invaluable asset for the implementation of the 4p1000 initiative<sup>6</sup>, which aims to demonstrate that soil carbon sequestration can make a major contribution to combatting climate change. Digital soil mapping can help provide periodic assessments of the world soil carbon stock and changes therein, as required for the evaluation

of the success of the 4p1000 initiative.

Digital soil mapping has caused a revolution in soil mapping that has not yet come to an end. It will not take long until we reach the milestone of having three-dimensional soil property maps at 100 m resolution for the entire globe, and once this is achieved the digital soil mapping community will continue to increase the accuracy and diversity of their maps. It is important that users of soil information recognise and appreciate these important developments, because adequate soil information is crucial for solving the five big problems of our time: food insecurity, climate change, environmental degradation, water scarcity, and threats to biodiversity.

ISRIC – World Soil Information is determined to make a major contribution to these efforts because it is at the heart of our mission, which is to

serve the international community with information about the world's soil resources to help address major global issues.

- 1 [www.africasoils.net](http://www.africasoils.net)
- 2 <http://www.globalsoilmap.net/>
- 3 <http://www.fao.org/globalsoilpartnership/en/>
- 4 <http://soilinfo-app.org/#/>
- 5 <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0125814>
- 6 <http://4p1000.org/>



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