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Kingdom of Morocco

Microelectronics ecosystem initiative

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I. INTRODUCTION

The Kingdom of Morocco is a constitutional monarchy with an elected parliament. Morocco has over 31 Million citizens with a density of 67.59 inhabitant/km², an urban population that exceeds 55% and a life expectancy of 72 years. Morocco has a history of independence with a rich culture that blends Arab, Berber and also other African and European influences. The country is organized in 16 regions, the capital city is Rabat and its main economic center is Casablanca; other main cities are Fes, Marrakech, Agadir, Tangier, Meknes and Laâyoun. For over a decade, Morocco launched large-scale projects aimed at elevating its infrastructure to international standards: Tanger-Med Port entered into service in 2007 with a total capacity of over 3 million containers (8 million in 2016), in addition to professional real estate of over 2000 hectares, complements the overall port infrastructure consisting of 11 ports meeting international standards. With the completion of the program, the highway network will exceed 1800 km in 2015, connecting all cities with over 400,000 residents. The main cities Rabat & Casablanca have already operational Tramways and Africa's first high speed railway is scheduled to start by 2015 requiring close to 1.8B$ in investments. Thanks to an Open Sky policy, the 15 international airports in Morocco (largest airport hub in the region) are used by a multitude of international companies and are connected to major cities and economic platforms of world affairs. Morocco also offers a wide network of Economic Activities Zones (Integrated Industrial Platforms, free zones, clusters...). Thanks to several free-trade agreements, Morocco offers investors free duty access to a market of 55 countries representing more than 1 billion consumers and 60% of world GDP. Most notable agreements are with EU, USA, Turkey, Egypt, Jordan and Tunisia. With three global operators (Fixed phone, mobile, Internet and data), the telecommunications sector in Morocco achieves every year an intense and sustained activity achieving world class standards and resulting in 97% mobile penetration and 13 million Internet users.

II. INDUSTRIAL, CHIP DESIGN AND EDA DEVELOPMENT

A. *Industrial development*

Morocco launched numerous strategic sectorial plans that ensure strong and sustainable economic growth. This reform momentum is marked by an innovative contracting approach and public-private partnerships advocating greater and coordinated participation of the private sector in the development of sectorial strategies and policies along with the funding of projects allowing to refocus the State's role on its regulatory powers. These strategies are part of a process to speed the development of strategic sectors like agriculture, fishery, mining, renewable energy, logistics and promising sectors such as automotive, aerospace and services with high added value. To cite a few of these initiatives: Tourism "Vision 2020" aims to reach 20 Million Tourists by 2020; Agriculture "Green Morocco" seeks to attract 15 B$ in investment and 10B$ in additional agriculture GDP; Renewable energy "Solar and Wind" should reach 2000MW in solar and 2000MW in wind generated power that will represent 40% of national electricity production with a budget of 15 B$ of investments; Finally Industry's "Emergence" program aims to create 220'000 new industrial jobs and generate an additional 1.6% industrial annual GDP

B. *Chip Design and EDA Development*

Morocco has successfully attracted worldwide leaders in

Capital	Rabat
Largest city	Casablanca
Language	Arabic
Area Total	720'000 km²
Population (2012 estimate)	31,000,000
Currency	Moroccan Dirham (MAD)
Time zone	**(UTC)**
Internet TLD	.ma

IC, EDA and embedded software areas to invest and establish R&D centers in the country. Most notable examples are STMicroelectronics, ST-Ericsson, Mentor Graphics, LEAR, Oberthur card systems, Nemotek Technologies … These companies have in turn played a major role in strengthening higher education training in electronics and related areas. Today, both public and private universities graduate several hundred highly skilled engineers in the area. To further strengthen collaboration between industry and academia in the area of microelectronics, the government has decided to directly fund the Morocco Microelectronics Cluster (MMC), a non-for-profit industry-academia consortium. The MMC has invested in a state of the art design center that allows Moroccan universities to remotely access EDA tools and design kits thanks to strong support from its major members STMicroelectronics and Mentor Graphics and extensive collaboration with France CNFM & CMP.

III. Academia & Human Resources

Human Resources in Morocco have all the ingredients to become the pillars of a competitive investment and value creator: education level, cultural openness, language skills and new technologies, commitment to entrepreneurship, adaptation capacity to change and competitive labor costs. 64% of Morocco's total population is under 34 and the active population is estimated to be 12 million. Morocco has 16 public universities and over 170 private higher education institutes training 370'000 students. The higher education system in Morocco graduates 40'000 laureates out of which 10'000 are engineers. Most Moroccans are multilingual: over 20 million speak French, over 5 million speak Spanish with a large penetration of English among young people and management staff. Finally, Morocco offers 300 vocational training institutions (some of which are sector specific), training 220,000 students per year. Companies can benefit from up to 7.5k$ of public subsidies for internal training of new hires over the three first years.

IV. Government Programs in favor of Innovation & ICT

A. Innovation

In 2009, Morocco's Industry Ministry launched a new initiative to boost its knowledge economy called "Morocco Innovation Initiative" with 5 major areas: Governance, financing, Infrastructure, Clusters and Human Resources. The budget for this initiative exceeds 50M$ and has funded close to 50 innovative projects up to date. The selection process addresses both the needs of innovative start-ups (with funding up to 120 k$ per project) and consortia of enterprises working collaboratively on an innovative product (with funding up to 500 k$ per project).

B. ICT

ICT development in Morocco has benefited from a dedicated program under the name "Maroc Numeric 2013" which ambitions to place Morocco among the leaders of emerging countries in the areas of ICT. The program seeks to improve four impact areas of ICT: Productivity in SMEs, e-gov initiatives that benefit the citizen, promotion of ICT industry and social transformation. The total state budget for this program is over 600M$ with the objectives of creating 26'000 new IT jobs and generate additional 1B$ in direct GDP and 2.9B$ in indirect GDP by end of 2013.

C. Foreign Investment

In addition to offering political stability, the Moroccan economy has demonstrated solid macro-economic fundamentals: steady GDP growth, controlled inflation, decreasing unemployment and decreasing public debt all of which have significantly contributed to regular growth in foreign direct investments. To further strengthen this dynamic, Morocco has developed a one-stop-shop offer for foreign investor with several regional investments centers and dedicated real estate and office space buildings at several integrated technology parks (such as Rabat Technopolis and Casanearshore). Additionally, a highly attractive set of incentives are today in place: investment subsidies in various forms (20% of land acquisition costs, 5% of infrastructure costs, 20% of professional training costs) and several tax exemptions (import duties on equipment, income tax capped at 20%, free zone areas additionally benefit from full profit tax exemptions for 5 years and no restrictions on benefits repatriation).

References

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Hicham Bouzekri received his Engineer diploma in electronics and communications from the Ecole Mohammadia d'Ingénieurs in 1995. He worked during two years as a microelectronics industrial process engineer for SGS-Thomson in Casablanca, Morocco. He obtained a Master's of Science from the University of Florida, Gainesville in 1998, and a Ph.D. from Texas A&M University, College Station in 2002. After joining STMicroelectronics (STM) in 2002, he held several management positions within STM and ST-Ericsson, and concurrently holds an adjunct faculty position at Al Akhawayn University. He has co-authored a number of scientific publications and industry standards in wireless communications. He serves as ST-Ericsson representative at USB-IF Board of Directors and he is member of MIPI – Technical Steering Group. After over 15 years of successful leadership in driving electronics and communications innovative ecosystems involving industries and universities in Morocco, he co-founded and currently serves as the president of the Morocco Microelectronics Cluster, a government backed, non-for-profit Industry-Academic consortium.